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7 Attorneys for Plaintiffs  
ORACLE CORPORATION and  
8 ORACLE INTERNATIONAL CORPORATION

9 UNITED STATES DISTRICT COURT  
10 FOR THE NORTHERN DISTRICT OF CALIFORNIA

11 SAN FRANCISCO DIVISION

12 ORACLE CORPORATION,  
a Delaware corporation, and ORACLE  
13 INTERNATIONAL CORPORATION,  
a California corporation,

14 Plaintiffs,  
15  
16 v.  
17 CRYPTO ORACLE, LLC,  
a Delaware limited liability company, and  
LOUIS KERNER, an individual,  
18  
19 Defendants.

Case No. 3:19-cv-04900-JCS

**[PROPOSED] FINAL JUDGMENT AND  
PERMANENT INJUNCTION**

20 Oracle Corporation and Oracle International Corporation (collectively “Oracle”) filed a  
21 Complaint alleging trademark infringement, trademark dilution, unfair competition and cybersquatting  
22 against Defendants Crypto Oracle, LLC (“Crypto Oracle”) and Louis Kerner (“Mr. Kerner”).  
23 Defendants incorporated a copy of Oracle’s ORACLE trademark in their CryptoOracle brand, which  
24 they have used to market a variety of consulting, educational event planning, and related services, all  
25 offered to Oracle’s customers and users who operate or have interest in the cryptocurrency field.  
26 Defendants consent to entry of judgment and permanent injunction to resolve this matter.

27 The Court now enters final judgment based upon the following undisputed facts. Each party  
28 has waived the right to appeal from this final judgment and each party will bear its own fees and costs

1 in connection with this action.

2 **I. FACTS AND CONCLUSIONS**

3 A. This Court has subject matter jurisdiction over this lawsuit and personal jurisdiction  
4 over Defendants. Venue is proper in this Court.

5 B. Since at least June 15, 1979, Oracle has promoted, offered and distributed its  
6 technology products, solutions and services under the ORACLE mark.

7 C. Oracle is the owner of a family of trademarks comprised, in whole or in part, of the  
8 word mark ORACLE and used in connection with Oracle's technology-related goods and services,  
9 which have been used in commerce for many years. Among these are the following U.S. trademark  
10 registrations:

<b>Trademark</b>	<b>Reg. No. / Date</b>	<b>Class / Products</b>	<b>Date of First Use</b>
ORACLE	1,200,239 July 6, 1982	Class 9: Pre-Recorded Computer Programs Recorded on Tapes, Disks and Diskettes.  Class 16: Introductory Manuals, User Manuals and Guides for Operation of Computerized Data Based Management Systems.	June 1979
ORACLE	1,555,182 Sept. 5, 1989	Class 41: Educational services, namely conducting classes and seminars in the field of computers and computer software used for database management purposes.  Class 42: Consulting services in the field of computer software used for database management purposes.	June 1986
ORACLE	2,107,556 Oct. 21, 1997	Class 35: Analysis and consulting services in the field of business information management, namely business analysis, business enterprise modeling, and business information organization; licensing software.  Class 36: Financing and credit services in the fields of computer software and hardware, computer related printed material, and computer related technical support, education and consulting; analysis and consulting services in the fields of finance, insurance, monetary affairs and real estate.  Class 42: Computer software and database design for others; computer hardware, software, and network analysis and consultation in the fields of finance, insurance, monetary affairs, real estate, and business information management.	June 1986
ORACLE	2,040,313 Feb. 25, 1997	Class 38: Broadcasting and communication services, namely, providing a computer network for delivery of computer programs, graphics, text, and other data and information.	March 1993
ORACLE	3,619,756 May 12, 2009	Class 41: Providing stadium facilities for sports and entertainment; arranging and conducting athletic competitions; entertainment in the nature of sporting events and athletic competitions; entertainment in the nature of live performances by a musical band, dance performances, orchestral performances; planning arrangement of electronic lighting; providing information in the field of sports and entertainment by means of the internet, telephone and digital transmission.	November 2006

Trademark	Reg. No. / Date	Class / Products	Date of First Use
ORACLE	3,893,045 Dec. 21, 2010	Class 9: Computer hardware; computers.	December 2008
ORACLE	4,102,532 Feb. 21, 2012	<p>Classes 9: computer peripherals; computer data storage devices, namely, magnetic tape drives, blank USB flash drives, computer disk drives, optical disc drives, blank digital data storage media, blank data storage tape, blank data storage disks; integrated computer hardware and computer operating software; computer hardware with preinstalled computer operating software; computer servers; computer processors and memory, microprocessors, central processing units, circuit boards, and integrated circuits; a full line of computer software to manage, analyze, retrieve, monitor, maintain, report on, structure, model, forecast, present and display data and information from computer databases, applications and the internet, and for the development, analysis, management, integration, deployment, virtualization and maintenance of computer software and hardware; database software to manage, monitor, track and organize data; computer software applications to manage, monitor, track and organize data, namely, web services software, application server software, business intelligence software, internet and intranet portal software, computer software to automate data warehousing, content management software, telephony software, fax messaging software, electronic mail software, electronic messaging software, scheduling software, social networking software, wireless communications software, operating system software, computer utility software, computer networking software, security and identity management software, virtualization software, cloud computing software, voice enablement software, computer programs for use in developing and executing other computer programs on computers, computer networks, and global communications networks; computer software applications to manage, monitor, track and organize data in the fields of marketing, sales, customer service, contracts, human resources, clinical research, health care, health sciences, education, communications and telecommunications, call centers, customer relationship management, public sector administration, public and private utilities, transportation, insurance, processing, analysis and management of financial transactions, governance, risk and compliance management, management of supply chains, orders, procurement, inventory, assets, projects and manufacturing, business process outsourcing, business consolidation management, business quality management, business project management, business stakeholder-shareholder relationship management, and strategic business, simulation, enterprise and resource planning.</p> <p>Class 16: printed materials, namely books, pamphlets, user manuals, instruction manuals, newsletters and magazines concerning computer software, computers and related topics; pens; pencils; notepad holders.</p> <p>Class 41: seminars, courses and workshops in the fields of computers, computer hardware, computer programming, and computer software; seminars, courses and workshops in the fields of design, development, analysis, implementation, management, integration, deployment, maintenance, updating and repair of computer hardware and software; seminars, courses and workshops in the field of technical support services for computer hardware and software; seminars, courses and workshops in the fields of testing, analysis and evaluation of the goods and services of others for the purpose of certification; seminars, courses and workshops in the field of computer database development; seminars, courses and workshops in the fields of design, creation, hosting, maintenance, operation and management of internet web sites; seminars, courses and workshops in the field of on-line trading to facilitate the sale and purchase of goods and services by others; seminars, courses and workshops in the field of providing a wide range of general interest information via the Internet.</p>	1984

Trademark	Reg. No. / Date	Class / Products	Date of First Use
		0Class 42: computer services, namely, consultation in the field of computer software, computers and computer hardware; programming, design, development, implementation, maintenance, updating and repair of computer software for others; leasing and rental of computer software; hosting of computer software; computer database development services; creating websites for others; design, creation, hosting and maintenance of web sites for others; consultation services and providing technical assistance related to the design, creation, hosting, maintenance, operation, and management of web sites for others; technical support services for computer software, namely, providing updates, upgrades, patches, fixes and technical documentation; providing information via the internet in the fields of computers, computer hardware, computer programming, and computer software.	
ORACLE	4,363,243 July 9, 2013	Classes 9: cases and stands for laptop, notebook and tablet computers, music players, and cell phones; computer mouse pads.  Class 14: clocks and watches.  Class 16: blank writing books, pen and pencil sets, mechanical pencils, pens.  Class 18: wallets, leather credit, debit and business card holders, umbrellas, leather wine bottle bags, traveling bags, messenger bags, sports bags, duffel bags, athletic bags, book bags, hard-sided and soft-sided carry-on bags.  Class 20: non-precious metal picture frames.  Class 21: drinking glasses and mugs.  Class 24: blanket throws.  Class 28: toys, namely, mechanical and stuffed dolls; sporting goods, namely, golf bags, golf balls, golf ball markers, and golf club head covers.  Class 41: entertainment services in the nature of sailboat racing and exhibitions.	1984
ORACLE	3,030,079 Dec. 13, 2005	Class 25: Clothing, namely, shirts, sweatshirts, jackets and caps.	July 1980
ORACLE (Stylized) Logo	2,997,144 Sept. 20, 2005	 Class 9: A full line of computer software to manage, analyze, retrieve, monitor, maintain, report on, structure, model, forecast, present and display data and information from computer databases and the internet, and for the development, analysis, management, integration, deployment and maintenance of computer software; web services software, application server software, database software, business intelligence software, internet and intranet portal software, data warehousing software, content management software, online trading software, online training software, telephony software, fax messaging software, electronic mail software, scheduling software, wireless communications software, and voice enablement software; computer software applications in the fields of marketing, sales, customer service, contracts, human resources, clinical research, health care, education, communications and telecommunications, call centers, public sector administration, public and private utilities, processing, analysis and management of financial transactions, management of supply chains, orders, procurement, inventory, assets, projects and manufacturing, business consolidation management, business risk management, business quality management, business project management, business stakeholder-shareholder relationship management, and strategic business, simulation, enterprise and resource planning; and instructional	1984

Trademark	Reg. No. / Date	Class / Products	Date of First Use
		manuals sold as a unit.	
<b>ORACLE Bar Logo</b> 	3,116,749 July 18, 2006	Class 9: A full line of computer software to manage, analyze, retrieve, monitor, maintain, report on, structure, model, forecast, present and display data and information from computer databases and the internet, and for the development, analysis, management, integration, deployment and maintenance of computer software; web services software, application server software, database software, business intelligence software, internet and intranet portal software, data warehousing software, content management software, online trading software, online training software, telephony software, fax messaging software, electronic mail software, scheduling software, wireless communications software, and voice enablement software; computer software applications in the fields of marketing, sales, customer service, contracts, human resources, clinical research, health care, education, communications and telecommunications, call centers, public sector administration, public and private utilities, processing, analysis and management of financial transactions, management of supply chains, orders, procurement, inventory, assets, projects and manufacturing, business consolidation management, business risk management, business quality management, business project management, business stakeholder-shareholder relationship management, and strategic business, simulation, enterprise and resource planning; and instructional manuals sold as a unit.	1984
<b>ORACLE Bar Logo</b> 	3,192,864 Jan. 2, 2007	Classes 16: Printed materials, namely books, pamphlets, user manuals, instruction manuals, newsletters and magazines concerning computer software, computers and related topics; pens; notepad holders.  Class 42: Computer services; namely, consultation in the field of computer software; programming, design, development, analysis, implementation, installation, management, integration, deployment and updating of computer software for others; dissemination, leasing and rental of computer software; leasing access to a full line of non-downloadable computer software; hosting of computer software for others; technical support services for computer software, namely problem troubleshooting; testing, analysis and evaluation of the goods and services of others for the purpose of certification; computer database development services; creating websites for others; design, creation, hosting and maintenance of web sites for others; information technology consultation services, namely providing technical assistance related to the design, creation, hosting, maintenance, operation, and management of web sites for others.	1984
<b>ORACLE</b>	4,870,864 Dec. 15, 2015	Class 42: Hosting of computer software; leasing and rental of computer hardware and computer peripherals; leasing access to computer hardware and computer peripherals; computer services, namely, providing access to non-downloadable computer software; computer services, namely, providing computer software, platforms, infrastructure, databases and data as a service; computer services, namely, providing cloud computing services in the following fields: a full line of computer software to manage, analyze, retrieve, monitor, maintain, report on, structure, model, forecast, present and display data and information from computer databases, applications and the internet, and for the development, analysis, management, integration, deployment, virtualization and maintenance of computer software and hardware; database software to manage, monitor, track and organize data; computer software applications to manage, monitor, track and organize data, namely, web services software, application server software, business intelligence software, internet and intranet portal software, computer software to automate data warehousing, content management software, telephony software, fax messaging software, electronic mail software, electronic messaging software, scheduling software, social networking software, wireless	December 1999

Trademark	Reg. No. / Date	Class / Products	Date of First Use
		communications software, operating system software, computer utility software, computer networking software, security and identity management software, virtualization software, cloud computing software, voice enablement software, and computer programs for use in developing and executing other computer programs on computers, computer networks, and global communications networks. computer software applications to manage, monitor, track and organize data in the fields of marketing, sales, customer service, contracts, human resources, clinical research, health care, health sciences, education, communications and telecommunications, call centers, customer relationship management, public sector administration, public and private utilities, transportation, insurance, financial transaction processing, analysis and management, governance, risk and compliance management, management of supply chains, orders, procurement, inventory, assets, projects and manufacturing, business process outsourcing, business consolidation management, business quality management, business project management, business stakeholder-shareholder relationship management, and strategic business, simulation, enterprise and resource planning.	
<b>ORACLE</b>	5,924,786 Dec. 3, 2019	Class 42: Platform as a service (PAAS) featuring computer software platforms for multi-chain, multi-cloud network management that deploys nodes and connects them to blockchains, and that enables users to manage blockchain applications; providing on-line non-downloadable computer software for enabling users to electronically create, exchange, store, send, receive, accept, and transmit digital tokens based on the blockchain technology; computer services, namely, providing on-line non-downloadable computer software for developing, building, and operating distributed applications; software as a service (SAAS) services featuring software for the encryption and authentication of the integrity of all data, digital assets, documents, and files across multiple channels using blockchain technology; platform as a service (PAAS) featuring blockchain-based computer software platforms and distributed computing software platforms for auditing and verifying digital information and codes; design, development and implementation of audit and security computer software for blockchain-based platforms; electronic data storage, namely, providing a blockchain technology-based, distributed database ledger for the storage of public, private or encrypted data, transactions and information; developing and updating of computer software for use in managing blockchain data; application service provider (ASP) featuring application programming interface (API) software for providing a platform for the development, testing, and integration of blockchain software applications; application service provider (ASP), namely, hosting computer application software for the purpose of developing, testing, and integrating blockchain applications and software; software as a service (SAAS) featuring software for developing, deploying, updating, and monitoring the performance of machine learning, deep learning, data science, predictive analytics, automation, and artificial intelligence applications; platform as a service (PAAS) featuring computer software platforms for building, hosting, and deploying chatbots and digital assistants; software as a service (SAAS) services featuring software for building, hosting, and deploying chatbots and digital assistants; application service provider (ASP) featuring application	Jul. 2018

Trademark	Reg. No. / Date	Class / Products	Date of First Use
		programming interface (API) software for building, hosting, and deploying chatbots and digital assistants; Consulting services in the field of software as a service (SAAS), namely, providing machine learning based predictive security, threat detection, security analytics, remediation and in-context cognitive advice to users seeking to protect and secure computer systems.	
<b>ORACLE OPENWORLD</b>	3,031543 Dec. 20, 2005	Class 35: Conducting trade shows and exhibitions in the fields of computers, computer software, computer peripherals, computer networking, technology planning, business management, and product demonstrations. Class 41: Conducting educational conferences, seminars, speeches, and entertainment, namely live and audio-visual presentations, all in the fields of computers, computer software, computer peripherals, computer networking, technology planning, and business management.	Sept. 1997

A number of the ORACLE marks identified above, including U.S. Registration Nos. 2,107,556 (registered October 21, 1997); 2,997,144 (registered September 30, 2005); 3,115,749 (registered July 18, 2006); 4,102,532 (registered February 21, 2012); and 4,870,864 (registered December 15, 2015), cover analysis and/or consulting services related to financial transactions. Many of these registrations have become incontestable. Together, these registered rights and Oracle's common law rights in its family of ORACLE-formative marks are referenced in this Complaint as the "ORACLE marks."

D. Among a wide range of other offerings, Oracle uses certain of its ORACLE marks in connection with products and services designed for those in the blockchain and cryptocurrency fields. Attached as Exhibit A to this Judgment and Permanent Injunction is a copy of the Oracle Blockchain Platform main website. Exhibit B collects examples of marketing materials promoting Oracle's blockchain events, products and services.

E. Defendants use the ORACLE mark in the CryptoOracle business name, domain names, and social media account usernames for services that overlap with and are related to goods and services offered by Oracle. Specifically, Defendants are using, without authorization, Oracle's ORACLE mark as part of the CRYPTO ORACLE name and mark to promote their own services.

## II. PERMANENT INJUNCTION AND AWARD

It is hereby ordered and adjudged as follows:

A. Commencing thirty (30) days after entry of this Final Judgment and Permanent

1 Injunction, Defendants, their agents, employees, attorneys, successors, assigns, affiliates, joint  
2 ventures, and any person(s) in active concert or participation with either Defendant, and/or any  
3 person(s) acting for, with, by, through, or under either Defendant's control who receive(s) actual  
4 notice of this Order, are hereby permanently enjoined and restrained, anywhere in the world, directly  
5 or indirectly, from doing, authorizing or procuring any persons to do any of the following:

6           1. Manufacturing, producing, sourcing, importing, selling, offering for sale,  
7 distributing, advertising, or promoting any goods or services that bear reproductions of the ORACLE  
8 marks;

9           2. Manufacturing, producing, sourcing, importing, selling, offering for sale,  
10 distributing, advertising, or promoting any goods or services that display any words or symbols that so  
11 resemble the ORACLE marks as to be likely to cause confusion, mistake, or deception, on or in  
12 connection with any product or service that is not authorized by or for Oracle;

13           3. Using any word, term, name, symbol, device, or combination thereof that  
14 causes or is likely to cause confusion, mistake, or deception as to the affiliation or association of either  
15 Defendant with Oracle, or as to the origin of either Defendant's goods or services, or any false  
16 designation of origin, false or misleading description or representation of fact, or any false or  
17 misleading advertising;

18           4. Further infringing the rights of Oracle in and to the ORACLE marks, or  
19 otherwise damaging Oracle's goodwill or business reputation;

20           5. Diluting or otherwise impairing the distinctiveness of Oracle's ORACLE  
21 trademark;

22           6. Otherwise competing unfairly with Oracle in any manner; and

23           7. Assisting, aiding or abetting any person or entity engaging in or performing any  
24 act prohibited by this paragraph.

25           B. Within seven (7) days of entry of this Judgment and Permanent Injunction, Defendant  
26 Mr. Kerner is ordered to file all forms necessary to expressly abandon his application, U.S. Serial No.  
27 88/242,342, to register the CRYPTOORACLE trademark; Defendants are prohibited from applying to  
28 register any other trade name, trademark, or service mark which is likely to be confused with, or that

1 dilutes the distinctive quality of the ORACLE marks.

2 C. This is a final judgment as to all claims asserted against Defendants related to the  
3 conduct described in the Complaint filed in this action, undertaken prior to the thirtieth day following  
4 entry of this Final Judgment and Permanent Injunction. Both parties shall bear their own costs.

5 D. If either Defendant is found to be in contempt of this injunction by a court of law, such  
6 Defendant agrees to pay to Oracle a liquidated penalty in an amount no less than \$10,000.00 as  
7 liquidated damages, plus any other non-duplicative penalties or damages arising from the contempt.

8 E. If Oracle commences an action for enforcement of this Judgment, the prevailing party  
9 shall be awarded reasonable attorneys' fees and costs from the other party for both the action  
10 enforcing this Judgment and the underlying litigation.

11  
12 Dated: February 18, 2020



13 Chief Magistrate Judge Joseph C. Spero  
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## EXHIBIT A

# Trust in Every Transfer

Customers demand international transfers that are quick, easy—and secure. See how Arab Jordan Investment Bank uses Oracle Blockchain Platform to exceed customer expectations and stay ahead of the competition.

[Watch the video \(1:00\) →](#)[Ready the customer story →](#)[Overview](#)[About Blockchain](#)[Blockchain Apps](#)[Startups](#)[Resources](#)[News and Opinion](#)[Customer Success Stories](#)

## What Is Oracle Blockchain?

[Oracle Blockchain Platform](#)[Oracle Blockchain Applications](#)

### Ready to Build

Oracle offers an easier way to adopt blockchain and transform your enterprise with the industry's most comprehensive and enterprise grade blockchain platform. Oracle Blockchain Platform securely extends your business processes and applications while enabling you to process business transactions much faster.

[Read the press release](#)

## Key Features



**Preassembled,  
Managed  
Service**



**Open**



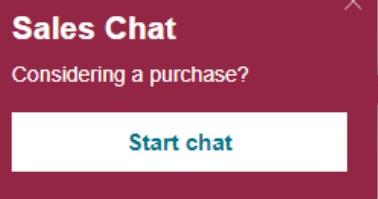
**Plug-and-Play  
Integrations**



**Enterprise Grade**



**Auto  
Oper**



### Preassembled, Managed Service

- A fully managed cloud platform for rapid provisioning and simplified administration of blockchain networks
- Includes all components: infrastructure dependencies, Hyperledger Fabric components, REST proxy, and operations console

## Preassembled, Managed Service

- A fully managed cloud platform for rapid provisioning and simplified administration of blockchain networks
- Includes all components: infrastructure dependencies, Hyperledger Fabric components, REST proxy, and operations console
- Easy partner onboarding with preintegrated, built-in identity verification

# CargoSmart and Oracle Blockchain Transform Shipping

"With the blockchain technologies, we see 65 percent savings in time of handling paper documents and documentation on shipments."

—Lionel Louie, Chief Commercial Officer, CargoSmart

[Watch the video](#)



## Gain More

## Business Benefits

Drive Innovation

Accelerate Business Growth

Reduce Cost and Risk

### DRIVE INNOVATION

Are you ready for new opportunities in a transformative technology?

- Enable new business models with a preassembled blockchain platform
- Rapidly onboard network participants with an enterprise-grade blockchain

### Sales Chat

Considering a purchase?

[Start chat](#)



Ebook: Cloud Essentials: Blockchain Technology for the Enterprise (PDF)



Article: How Blockchain Can

- Enable new business models with a preassembled blockchain platform
- Rapidly onboard network participants with an enterprise-grade blockchain
- Improve transparency across your IT ecosystem with plug-and-play integrations



Ebook: Cloud Essentials: Blockchain Technology for the Enterprise (PDF)



Article: How Blockchain Can Protect Reputations and Attract Committed Customers



Analyst report: IDC: "The Emergence of Blockchain: Seizing Opportunity," December 2017

## Oracle Blockchain Cloud Platform

# Follow the Chain

**Analyst Report**

Enterprise Blockchain Essentials Guide (PDF) →

**Blog**

What Everybody Ought to Know About Oracle's New Blockchain Platform Release →

**Developer**

Developing DApps on the Oracle Blockchain Platform →

**Pricing**

Pricing Details for Oracle Blockchain Platform →

**Sales Chat**

Considering a purchase?

**Start chat**

The image shows two rectangular cards side-by-side. The left card has a grey background with an orange header containing the text 'Developing DApps on Oracle Blockchain Platform' and 'A Developer's Guide'. Below the header is a small image of a smartphone displaying a grid pattern. The right card has a teal background with a white header containing the text 'USD - US Dollar (\$)' and a dropdown arrow. Below the header is a small image of a smartphone displaying a white screen. Both cards have a green footer bar with white text: 'Developing DApps on the Oracle Blockchain Platform' on the left and 'Pricing Details for Oracle Blockchain Platform' on the right, each followed by a white arrow pointing to the right.

[See more Blockchain resources →](#)

#### Trending Blockchain Blogs

## What's New in Blockchain

### The Benefits of Oracle Blockchain for Payments and Transfers

As financial institutions look to enhance their customers' online banking experience, a number of them are looking at blockchain technology as a way to accelerate the payment process and cross-border transfers...

### Why Blockchain is Spreading to ERP and Elsewhere

A PwC survey looks at the current state of blockchain adoption and use cases...



## Get Started



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Watch a demo



Free trial



Blog



Podcast



Events

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Java for Developers

Software Downloads

Try Oracle Cloud Free

### Sales Chat

Considering a purchase?

[Start chat](#)



Integrated Cloud  
Applications & Platform Services



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## EXHIBIT B



Oracle Cloud Platform Blog Oracle Cloud Platfor MENU

# Stay up to date on Oracle's Cloud Platform solutions. Get news, tips and tricks to help you on your cloud journey.

Try Oracle Cloud Platform  
For Free



BLOCKCHAIN

October 9, 2018



## The Top Blockchain Sessions at Oracle OpenWorld



Mary Hall

DIRECTOR, ORACLE BLOCKCHAIN PRODUCT MARKETING

Oracle Open World is fast approaching and Blockchain is on the agenda. Oracle is preparing to welcome over 50,000 customers in San Francisco, CA the week of Oct. 22-25 at Moscone Center. In July, Oracle announced the general availability of their Oracle Blockchain Cloud Service with early adopters like CargoSmart, Certified Origins, and Arab Jordan International Bank. The Oracle OpenWorld conference will offer attendees the chance to hear directly from these customers as well as some of the foremost Blockchain industry experts in the world like



Leanne Kemp, CEO of UK Blockchain start-up [Everledger](#). The conference offers use cases, hands-on labs, demos and perhaps most importantly the opportunity for customers to have interactive discussions with developers and users.

## Why Blockchain?

Why is [Blockchain technology](#) so hot? A few simple reasons. Putting data on the digital ledger of Blockchain enables organizations to quickly share data in a secure environment. Blockchains can be public or permissioned. Public blockchains are completely open to all users and governed by consensus algorithms. Permissioned blockchains are set-up to only allow those who have been granted permission to certain transactions or data to have access to it.

Early users of blockchain technology have benefited from significant benefits including:

- a reduction in manual paper-based processes

- accelerated transaction times
- increased collaboration among trading partners and organizations

These are just a few of the benefits that will be discussed at [Oracle OpenWorld](#) during these sessions:

## Customer Use Cases

**How to Utilize Oracle Blockchain in the Banking Industry** [BOF5018] ICS Financial Systems, a company that provides software and services for banks and financial institutions, will discuss a successful blockchain trial using Oracle Blockchain Cloud Services.

Speakers: Ghassan Sarsak, Chief Technology & Innovation Officer and Ra'ad Malkawi, Digital Banking & Innovation Product Manager

October 23, 2018 4:00pm – 4:45pm Moscone Center, Moscone West - Room 2005

**Making Enterprise Blockchain a Reality: Oracle Blockchain Use Cases** [BUS4591] This session showcases customer and partner solutions in financial services, supply chain, and other verticals and explains how customers identify applications suitable to enterprise blockchain.

Speakers:

- Federico Dragoni CFO of Certified Origins
- Lionel Louie, Chief Commercial Officer,

## CargoSmart

- Mark Rakhmilevich, Sr. Director, Blockchain  
Product Management, Oracle

Tuesday, Oct 23, 5:45 p.m. - 6:30 p.m. | Moscone West - Room 3020

### **Enterprise Blockchain: Maximizing Global Supply Chain Transactions [THT6996]**

In this session hear from KPMG and Oracle as they share their perspective and experience with designing, deploying, and enabling cross-border movement of unfinished and finished goods from source to delivery within global supply chains. The teams also describe the tax trade and customs benefits companies will gain by leveraging smart contracts on a distributed ledger and cloud infrastructure.

#### **Speaker:**

Arun Ghosh, Principal, Advisory, Digital Enablement, KPMG

Monday, Oct 22, 12:30 PM - 12:50 PM | The Exchange @ Moscone South - Theater 1

### **Blockchain: A Killer App for Enterprise Digital Transformation [PRO5856]**

This session will feature executives from Oracle and Ephlux presenting a complete “track n trace” capability across an integrated pharma supply chain connecting the production equipment, suppliers, partners and distributors via a universal ledger keeping a real-time account of everything happening in your procurement, warehouse, production floor and the distribution

network.

Speakers:

- Atul Mahamuni, Vice President, Product Development, Oracle
- Prasen Palvankar, Senior Director, Oracle
- Ali Nasim, CEO, Ephlux Private Limited

Wednesday, Oct 24, 11:15 a.m. - 12:00 p.m. |  
Moscone South - Room 104



**Pictured: Leanne Kemp, CEO of Everledger will be at speaking at Oracle OpenWorld**

**Enabling Blockchain for Your Enterprise Apps: A Practical Guide [CAS1395].** This session features a panel of 3 early adopters discussing their success with Blockchain technology for healthcare, tracking precious gems and accelerating business transactions. This session takes place on Thursday Oct, 25th at 1:00 pm. Speakers include:

- Moses Rajan, SSOT Health
- Leanne Kemp, CEO everledger
- Chema Mínguez, Transactional Services Manager, SERES

Thursday, Oct 25, 1:00 p.m. - 1:45 p.m. | Moscone West - Room 3000

## Meet the Developers

### **Boost Developer Productivity and Build Fast, Flexible, Secure Blockchain Apps [PRO6682]**

- Todd Little, Blockchain Architect, Oracle

Monday, Oct 22, 4:45 p.m. - 5:30 p.m. | Moscone West - Room 3024

### **Creating a Trusted, Supply Chain Network Using Oracle Autonomous Blockchain Cloud Service [HOL6309]**

Speakers:

- Deepak Goel, Senior Director, Software Development, Oracle
- Todd Little, Blockchain Architect, Oracle
- Victor Mendo Alonso, Oracle
- Emmanuel Abiodun, Architect, Oracle
- Guntimadugu Raju, Oracle
- Sunil Suseelan, Oracle

Monday, Oct 22, 3:45 p.m. - 4:45 p.m. | Marriott  
Marquis (Yerba Buena Level) - Salon 5/6

Tuesday, Oct 23, 11:15 a.m. - 12:15 p.m. | Marriott  
Marquis (Yerba Buena Level) - Salon 5/6

Thursday, Oct 25, 9:00 a.m. - 10:00 a.m. | Marriott  
Marquis (Yerba Buena Level) - Salon 5/6

## Demos

**Authenticating Beer Ingredients with Blockchain** Attendees will have the opportunity to try beers with ingredients authenticated by using Blockchain technology. After tasting the beers, attendees can then vote for their favorite beer on our mobile app.

Location: CodeONE, Developer Exchange, Level One, Moscone



### **Blockchain Applications Use Cases and Live Demos [PRO6215]**

Speaker: David Haimes, Senior Director, Oracle

Wednesday, Oct 24, 11:15 a.m. - 12:00 p.m. |  
Moscone South - Room 154

## Oracle Blockchain Roadmap & Futures

## Oracle Blockchain Cloud Service: Strategy and Roadmap [PRO4589]

Speakers:

- Deepak Goel, Senior Director, Software Development, Oracle
- Frank Xiong, Group Vice President, Oracle

Monday, Oct 22, 12:30 p.m. - 1:15 p.m. | Moscone West - Room 3018

These are just a few of the [blockchain sessions coming up at OpenWorld](#). Bookmark this blog post to stay-up to date as we'll add new sessions until the conference date!

## Oracle's Blockchain Cloud Service: Sign-up for a trial before OpenWorld

Oracle's Blockchain Cloud Service is built on top of the Linux Foundation's Hyperledger Fabric. It is pre-assembled with all the underlying infrastructure dependencies, container lifecycle management, event services, identity management, REST proxy, and a number of operations and monitoring tools integrated under a single console, expediting the set-up and application development process. Oracle Blockchain Cloud Service is an Oracle-managed cloud platform backed by a 99.95 percent availability SLA, with built-in high availability configuration, autonomous recovery agents, as well as continuous ledger backup capabilities that can enable multi-data center disaster recovery across availability domains. [Sign-up for a](#)

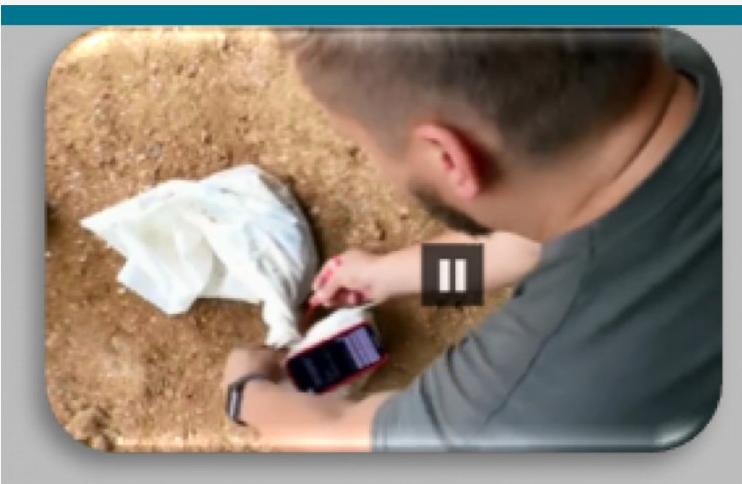
complementary Oracle Blockchain Cloud Service trial today.

## Be the first to comment

Comments ( 0 )



## Recent Content



BLOCKCHAIN

Oracle Cloud on a Roll: From One 'Next Big Things' Session to Another

The Oracle Open World Showcase in London this January We wrapped up an exciting Open World in

## BLOCKCHAIN

**Ensuring sustainability and ethical  
sourcing with Oracle Blockchain  
Platform**

London last month with a spotlight  
on all...



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BLOCKCHAIN  
CLOUD SERVICE

A professional woman with blonde hair, wearing a dark blue t-shirt, is gesturing with her hands while speaking to an audience. In the foreground, a person's hands are visible holding a white tablet device. The background shows other audience members.

Integrate Your  
Business  
Network with  
the Blockchain  
Platform

## Why Blockchain?

Enable real-time transactions and securely share tamper-proof data across a trusted business network.

Oracle Blockchain Cloud Service gives you a pre-assembled platform for building and running smart contracts and maintaining a tamper-proof distributed ledger.



### Increase business velocity

Create a trusted network for B2B transactions and extend and automate your operations beyond the enterprise. Optimize business decisions with real-time information visibility across your company's ecosystem.

### Reduce operations costs

Accelerate transactions and eliminate the cumbersome offline reconciliations by using a trusted shared fabric of common information. Eliminate intermediaries and related costs, possible single points of failure, and time delays by using a peer-to-peer business network.

### Reduce the cost of fraud and regulatory compliance

Gain the security of knowing that business-critical records are tamper-proof via securely replicated, cryptographically linked blocks to protect against single points of failure and insider tampering.

Why  
Blockchain?

What is It?

Recognize  
Yourself?

Create  
Trusted  
Networks

Automate  
with Smart  
Contracts

Develop or  
Integrate  
Applications

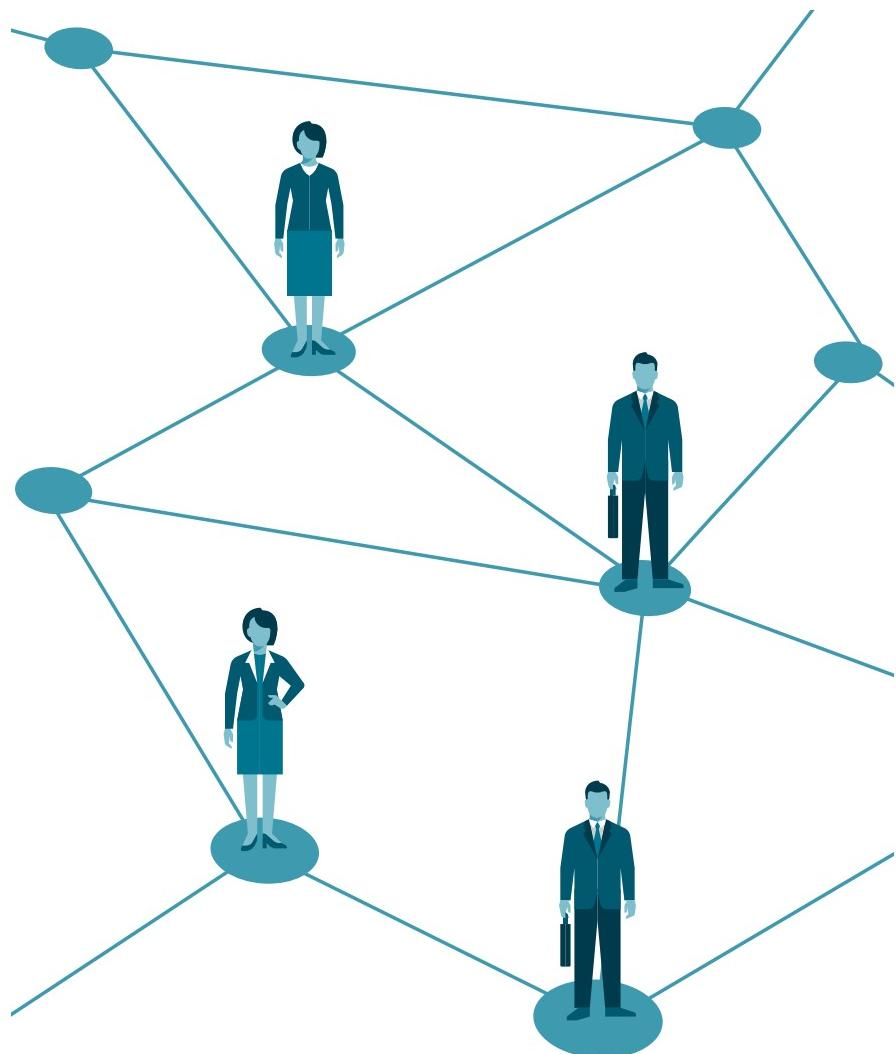
Conduct  
Private  
Transactions

Rapidly  
Add New  
Members

Simple  
Console

Get  
Started

## What is It?



It's a trusted peer-to-peer network maintaining a distributed ledger.

Oracle Blockchain Cloud Service is a network consisting of validating nodes (peers) that update the ledger and respond to queries by executing smart contract code—the business logic that runs on the blockchain.

External applications invoke transactions or run queries through client SDKs or REST API calls, which prompts selected peers to run the smart contracts.

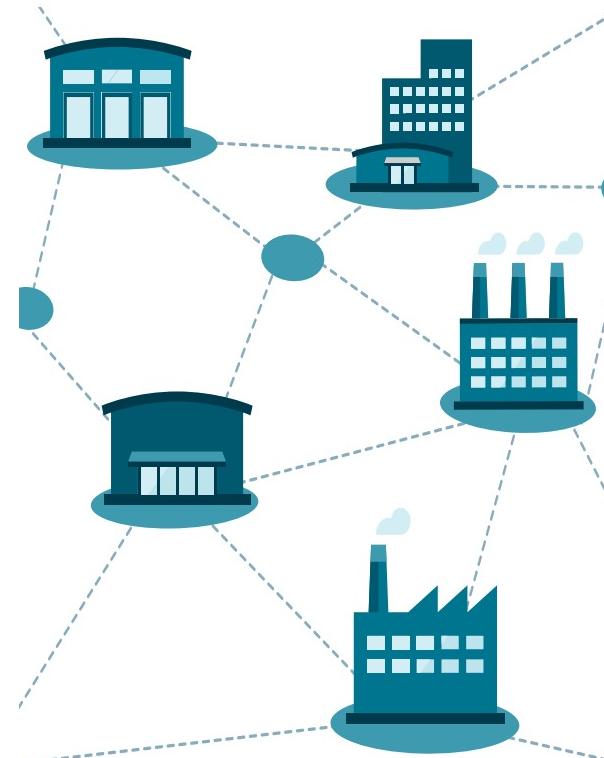
Multiple peers endorse (digitally sign) the results, which are then verified and sent to the ordering service. After consensus is reached on the transaction order, transaction results are grouped into cryptographically secured, tamper-proof data blocks and sent to peer nodes to be validated and appended to the ledger.

Service administrators can use the Oracle Blockchain Cloud Service web console to configure the blockchain and monitor its operation.

## Recognize Yourself?

# Can your enterprise answer yes to these questions?

- Do you have to deliver business results with a ready-to-go, enterprise-grade blockchain solution?
- Do you need to simplify your infrastructure and provide highly efficient blockchain operations to your application developers and lines of business?
- Are you being asked to deliver innovative capabilities faster and respond to the competition faster?
- Do you rely on SaaS applications or on-prem Oracle Fusion applications for enterprise processes that need to be extended beyond the enterprise boundaries?



## Enterprise-Grade Cloud Platform

- Scale the network participants and transaction volumes and ensure that your operations run continually with resilience, high availability, and automatic recoverability.
- Secure access in a permissioned blockchain protected by Oracle Identity Cloud Service with single sign-on and key management services.
- Set up confidentiality domains to conduct private transactions over secure channels.

## ► Explore



Enterprise-  
Grade



Managed  
PaaS



Speed to  
Market



Extend  
Enterprise  
Boundary

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## Managed Blockchain PaaS

- Provision and configure blockchain resources rapidly and use built-in dashboards to detect bottlenecks in real time.
- Rapidly add partners to create a flexible blockchain network with dynamic configuration.
- Leave updates, backups, and other operational worries behind with Oracle managed services.

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## Speed to Market with Rich Integrations

- Use REST APIs to simplify the integration for cloud-based or on-premises applications.
- Invoke blockchain operations from Java or JavaScript by using available SDKs and harness the Cloud Application Development Platform and ready-to-use DevOps capabilities.
- Use single sign-on to connect Oracle SaaS applications identity domains with Oracle Blockchain Cloud Service.

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## ► Explore



Enterprise-  
Grade



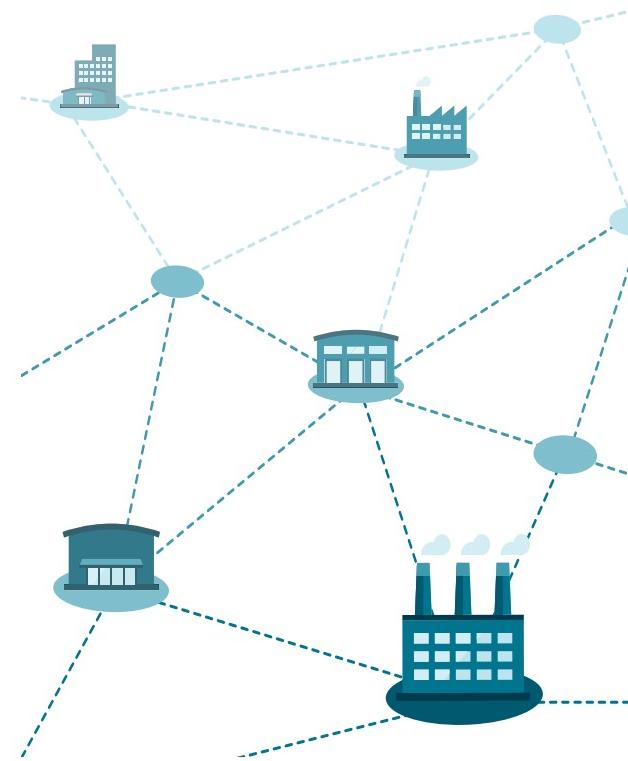
Managed  
PaaS



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Market



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Enterprise  
Boundary



## Extend Enterprise Boundaries

- Speed up business processes through blockchain integration accelerators, such as PaaS-for-SaaS and Oracle Integration Cloud Service, to easily leverage B2B transactions and partner data from enterprise applications.
- Enable new business models and revenue streams by reaching untapped markets leveraging blockchain-verified identity and offerings.

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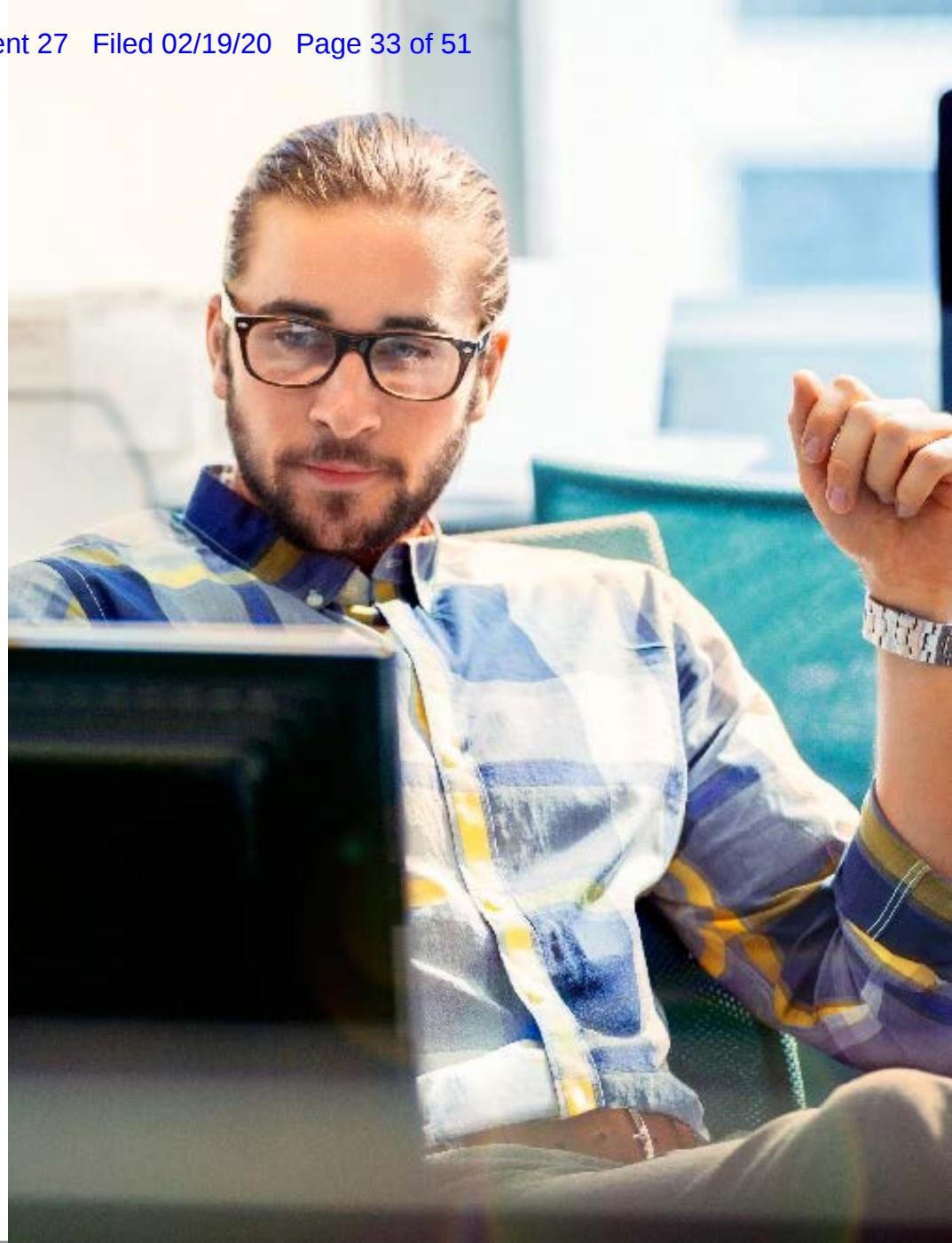
## Create Trusted Networks

# No Assembly Required.

Oracle Blockchain Cloud Service comes with a complete set of infrastructure services and embedded resources: compute, containers, storage, identity management, and event streaming to help you quickly set up and run a production-ready blockchain.

Easily create an instance of Oracle Blockchain Cloud Service. After you specify a few parameters, Oracle provisions the underlying infrastructure with the required Blockchain network components, REST proxy, and an administration console.

Need a partner to join your network? No problem. They can create a service instance just for that. Provision the service, and then simply log in to the Oracle Blockchain Cloud Service web console to complete the certificate exchange and join the existing blockchain network.



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**Automate with Smart Contracts**

# Let business logic **automate transactions and query ledger data for you.**

Oracle understands the value of the trusted business network isn't only about sharing static information. It's also about conducting non-repudiable transactions and tamper-proof ledger updates. This is where your smart contracts come in because they can:

- Verify account balances before transferring funds.
- Check that a proposed sales order complies with certain standards.
- Transfer ownership of assets between parties after conditions are met.
- Match purchase and sales orders or reconcile invoices and trigger payments.
- Update a provenance record to ensure that the rights to a piece of art or a music composition are protected.

And much more.

Developers use Oracle Blockchain Cloud Service to quickly build smart contracts (chaincodes) to define the data schema in the ledger, initialize it, perform updates when triggered by applications, and respond to queries. Chaincodes can also post events that allow applications to be notified and perform downstream operations. For example, when certain purchase orders, invoices, and delivery records are matched by a smart contact, it can post an event so that subscribing applications can process related payments and update the internal Enterprise Resource Planning system.



## Develop or Integrate Applications



## Flexible options to create and extend applications.

Start developing blockchain applications within minutes with no need for complex setup. Leverage API-driven development for cloud or on-premises applications using REST API and API management service to invoke smart contract transactions or query ledger data.

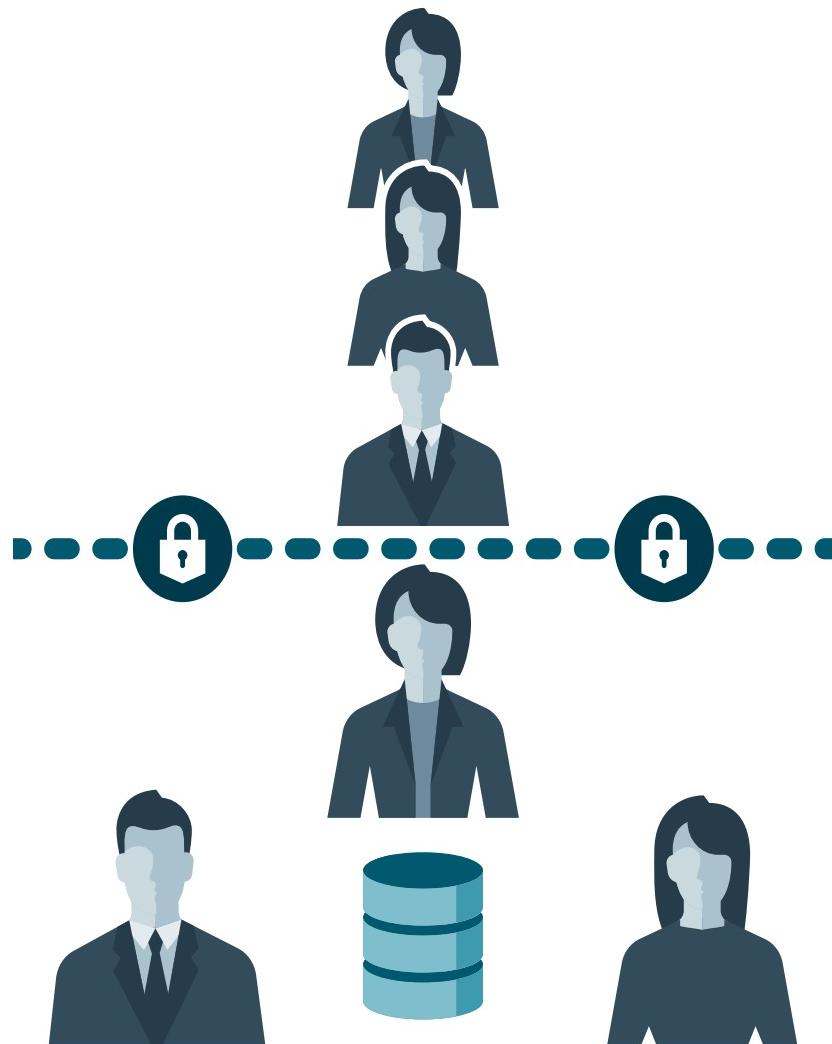
Java and Node.js (JavaScript) SDKs give you another option for enabling applications to register and enroll users, creating channels and adding peers, querying ledger data, deploying and invoking new smart contracts, and subscribing to events.

Oracle enables enterprise IT developers to extend SaaS applications to use Oracle Blockchain Cloud Service through PaaS-for-SaaS using SDKs or Oracle Integration Cloud Service using REST APIs.

Enterprises and independent software vendors can build new applications in Oracle Java Cloud Service, polyglot Oracle Application Container Cloud Service, Oracle Mobile Cloud Service or Oracle Application Builder Cloud Service. You can also trigger blockchain transactions from your Integration, Service Oriented Architecture, or Oracle Process Cloud Service or, in a hybrid scenario, from outside the Oracle Cloud.



## Conduct Private Transactions



If you want transaction privacy, **Oracle Blockchain Cloud Service has the answer.**

Not all business data exchanged between members is suitable for sharing with all participants. With Oracle Blockchain Cloud Service, controlling member access is easy: Define one or more channels to isolate peers into subnets and create private ledgers. Blockchain members have the power to conduct private and confidential transactions while coexisting with restricted members on the same blockchain network.

The power of channels for conducting confidential transactions is critical. For example, you can safeguard pricing information between buyer and seller by using a private channel, while registering the ownership transfer on a channel that's open to all members.

Peers can only join channels subject to approval by other organizations on that channel. And client requests are routed to the specified channel to run a smart contract that was deployed on that channel. Once endorsed and verified, the results are updated in that channel's ledger, which is only accessible to its member peer nodes.



**Rapidly Add New Members**

# Extend the network across members and geographies.

With Oracle Blockchain Cloud Service, the network expands as you add new members next door or across the world. Your partners sign up for their own instance of Oracle Blockchain Cloud Service to join an existing blockchain network. After their instance is provisioned in any of the Oracle Public Cloud global data centers or at customer data center on Oracle Cloud Machine, you can invite them to join your blockchain network by exchanging the digital certificates. Then, their peers can join the network and any channels for which they are authorized to securely conduct transactions and share updates. A global enterprise can operate local peers in multiple regions and still be a part of the same blockchain network. What's more, organizations running compatible versions of Hyperledger Fabric outside of the Oracle Cloud can also be invited to join.



## Simple Console

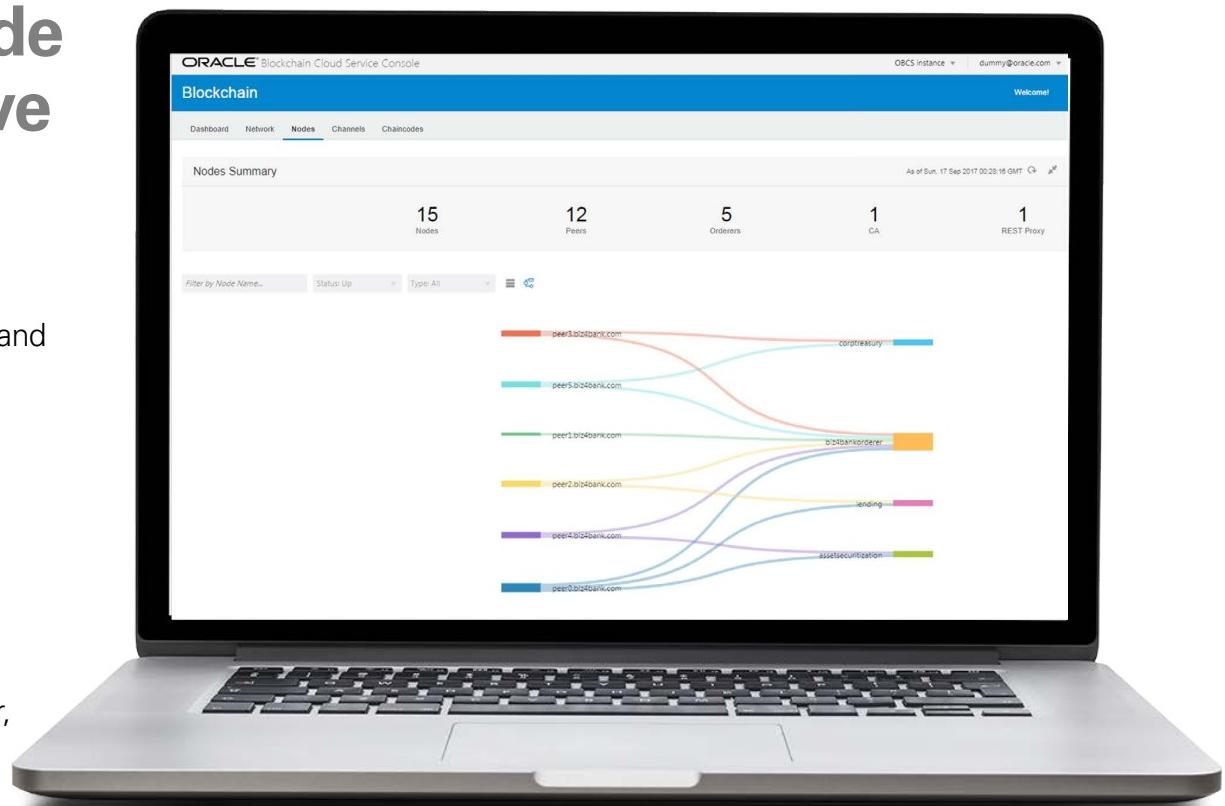
Administration, monitoring, and troubleshooting **made simple with the intuitive UI console.**

### Common administration tasks

- Bring up and take down the blockchain network and manage peers, orderers, and so on.
- Configure network channels and set policies.
- Deploy smart contracts.
- Add peers, orderers, and member organizations.

### Easy monitoring and troubleshooting

- Monitor the network dashboard.
- View the network topology and monitor the peer, orderer, and network component status.
- Monitor channel and ledger metrics.
- Search and browse ledger blocks.
- View node logs to troubleshoot.



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## Learn More

- View data sheets, FAQs, pricing, and additional resources on the [Oracle Blockchain Service](#) product page.
- Sign up for a free trial at [Oracle Cloud](#).
- Purchase a subscription and get started by visiting the [Oracle Help Center](#).

## Connect

Twitter: [@Oracle Cloud](#)

Facebook: [Oracle Cloud](#)

LinkedIn: [Official Oracle Cloud Group](#)

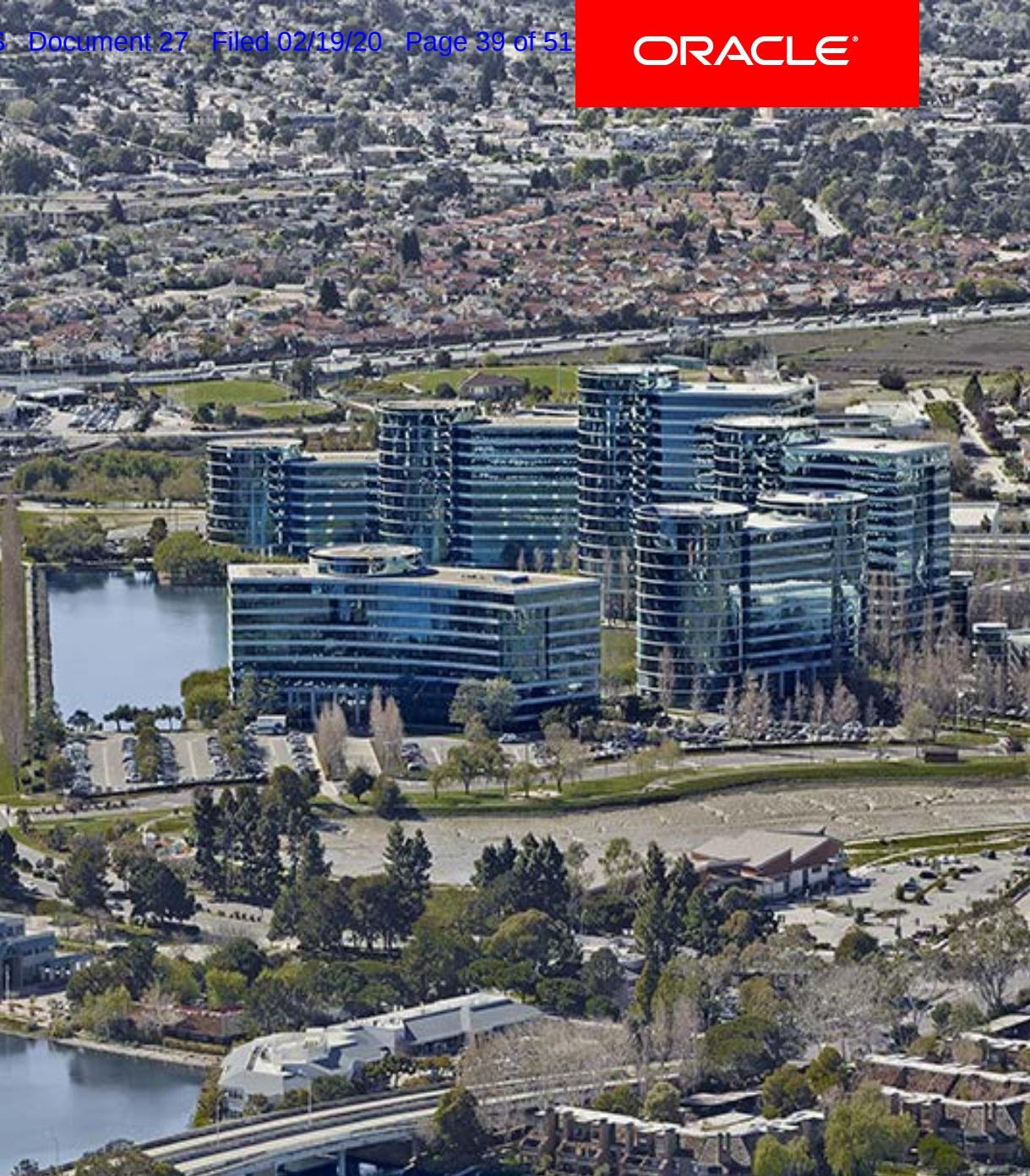
YouTube: [Oracle Cloud Channel](#)

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Visit our Oracle Cloud community.

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Safe Harbor

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# Integrated Cloud

## Applications & Platform Services

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## Blockchain Platform

[Try It](#)[Buy Now](#)[Overview](#) [Features](#) [Pricing](#) [Learn More](#) [Customers](#) [Marketplace](#)

### Securely, reliably extend business processes and accelerate B2B transactions

A comprehensive distributed ledger cloud platform to provision blockchain networks, join other organizations, and deploy & run smart contracts to update and query the ledger.

Reliably share data and conduct trusted transactions with suppliers, banks, and other trade partners through integration with existing or new cloud-based or on-premises applications.

[View eBook →](#)

### Pre-assembled, Managed PaaS

Auto-provisioned Hyperledger Fabric components, REST proxy and administration and operations console. Built-in identity management, object store and other infrastructure for rapid provisioning and simplified administration of blockchain networks, reducing cost & setup time from weeks to minutes

### Plug and Play Integrations

6-10x faster integration with diverse systems of record in Oracle SaaS, PaaS, custom and 3rd party apps in cloud & on premises, improving time to market by months

### Enterprise-Grade

The only enterprise-grade managed blockchain service with 99.95% SLA with enhanced security, built-in High Availability and embedded ledger backups for continuous operations

### News and More



#### Introducing Oracle Blockchain Platform

Blockchain is an innovative technology that can drive innovation, accelerate business, and reduce risk and costs associated with common business processes. See how easy it can be to gain advantage from the industry's most comprehensive, enterprise-grade blockchain cloud platform.

[Tune in →](#)

#### Webcast: Making Blockchain a Reality in Retail

Discover the benefits of blockchain for retailers in this on-demand webcast cohosted by Oracle and Aberdeen, including insights from Aberdeen's 2018 Blockchain in Retail study.

[Watch now →](#)

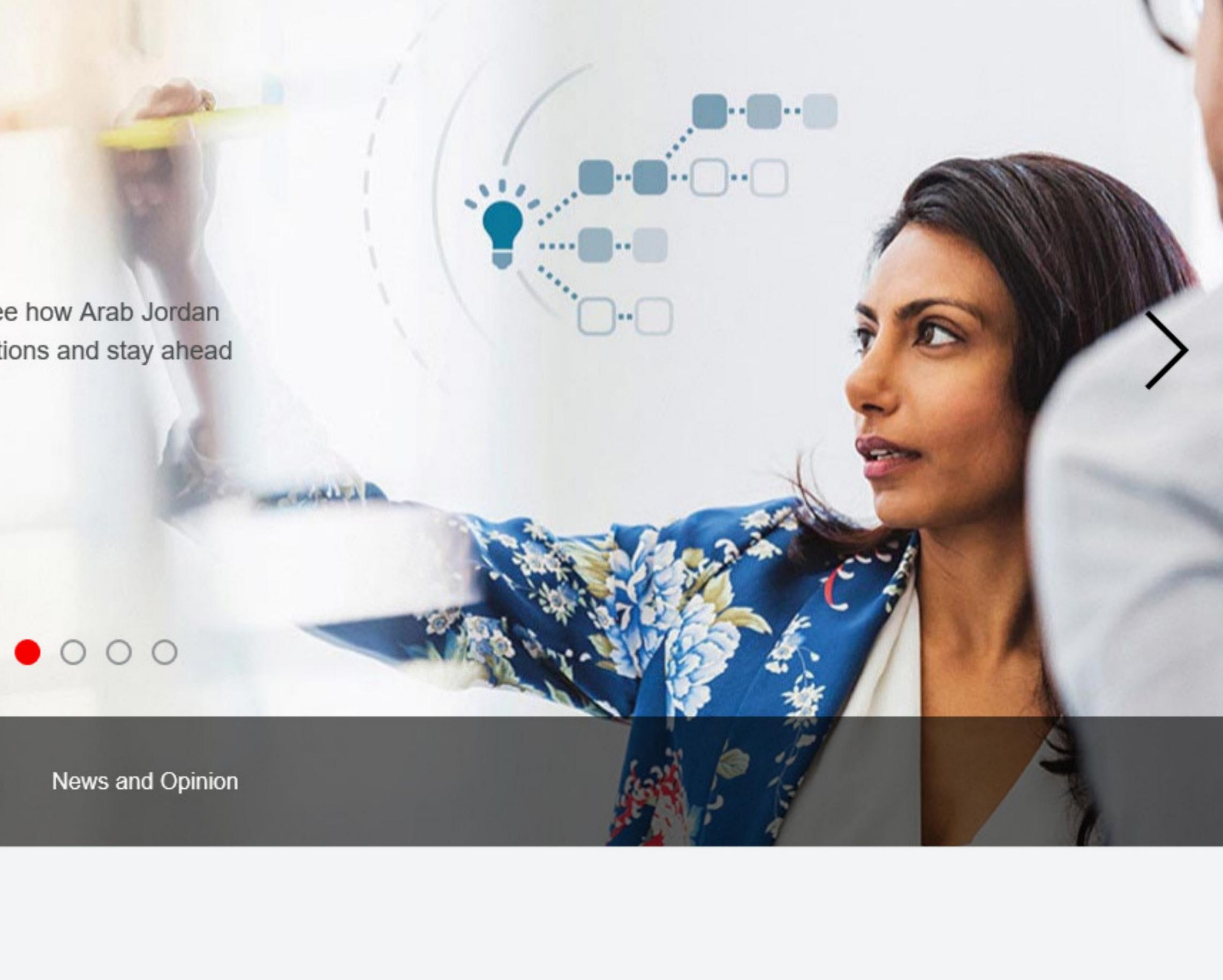
#### IDC: The Emergence of Blockchain

Securely extend your business applications and processes while accelerating transactions across your entire ecosystem with the power of blockchain.

[Read the report →](#)

# Trust in Every Transfer

Customers demand international transfers that are quick, easy—and secure. See how Arab Jordan Investment Bank uses Oracle Blockchain Platform to exceed customer expectations and stay ahead of the competition.

[Watch the video \(1:00\) →](#)[Ready the customer story →](#)[Overview](#) [About Blockchain](#) [Blockchain Apps](#) [Startups](#) [Resources](#) [News and Opinion](#)

## What Is Oracle Blockchain?

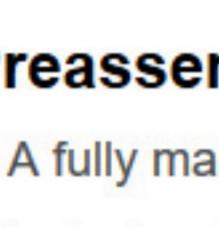
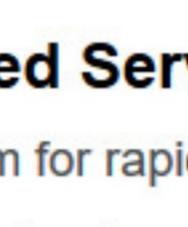
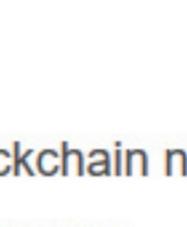
[Oracle Blockchain Platform](#)[Oracle Blockchain Applications](#)

### Ready to Build

Oracle offers an easier way to adopt blockchain and transform your enterprise with the industry's most comprehensive and enterprise grade blockchain platform. Oracle Blockchain Platform securely extends your business processes and applications while enabling you to process business transactions much faster.

[Read the press release](#)

### Key Features

**Preassembled, Managed Service****Open****Plug-and-Play Integrations****Enterprise Grade****Automated Operations****Expertise and Experience**

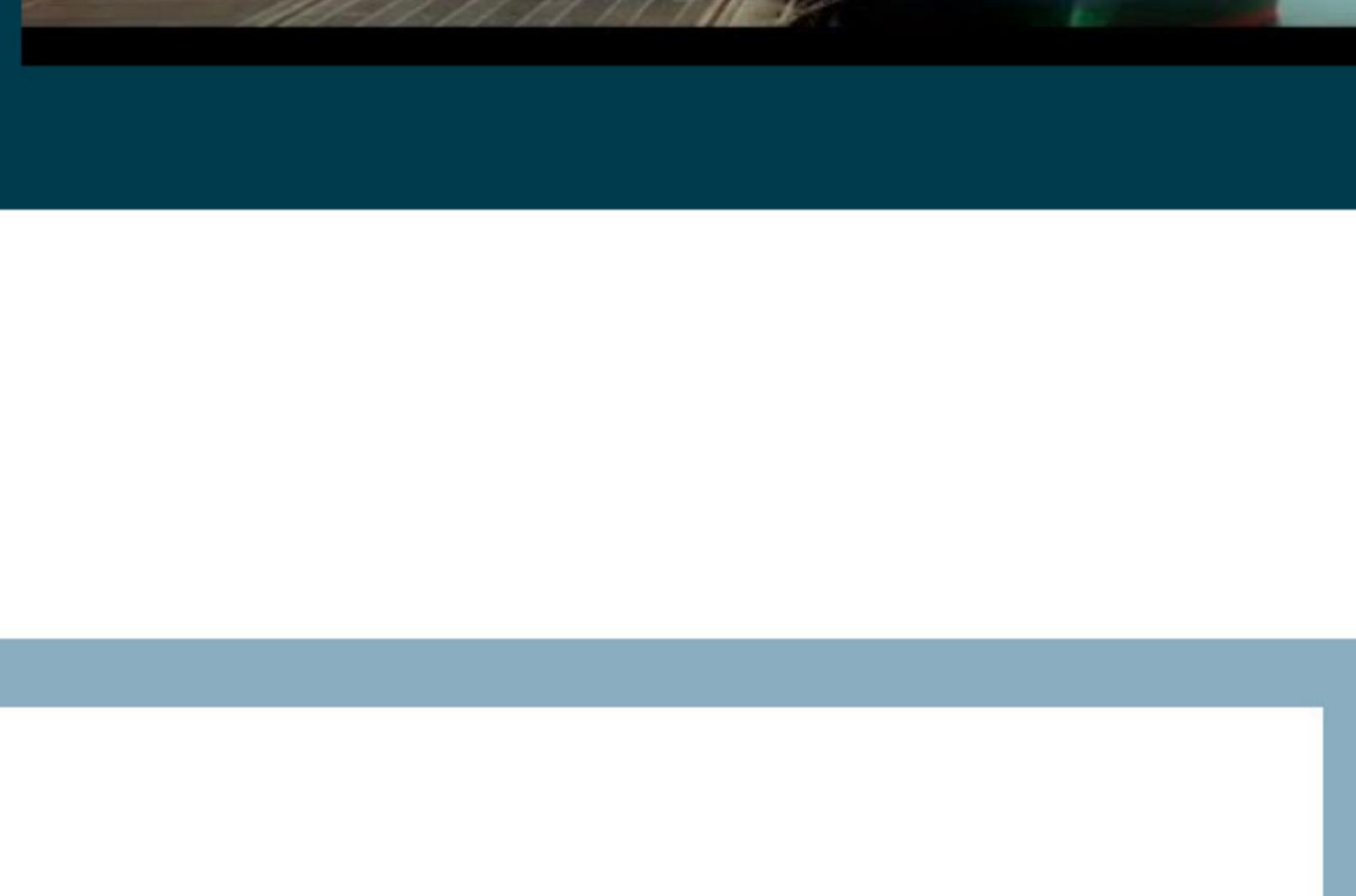
#### Preassembled, Managed Service

- A fully managed cloud platform for rapid provisioning and simplified administration of blockchain networks
- Includes all components: infrastructure dependencies, Hyperledger Fabric components, REST proxy, and operations console
- Easy partner onboarding with preintegrated, built-in identity verification

## CargoSmart and Oracle Blockchain Transform Shipping

"With the blockchain technologies, we see 65 percent savings in time of handling paper documents and documentation on shipments."

—Lionel Louie, Chief Commercial Officer, CargoSmart

[Watch the video →](#)

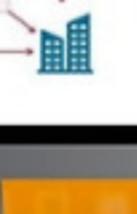
### Gain More

## Business Benefits

[Drive Innovation](#)[Accelerate Business Growth](#)[Reduce Cost and Risk](#)[DRIVE INNOVATION](#)

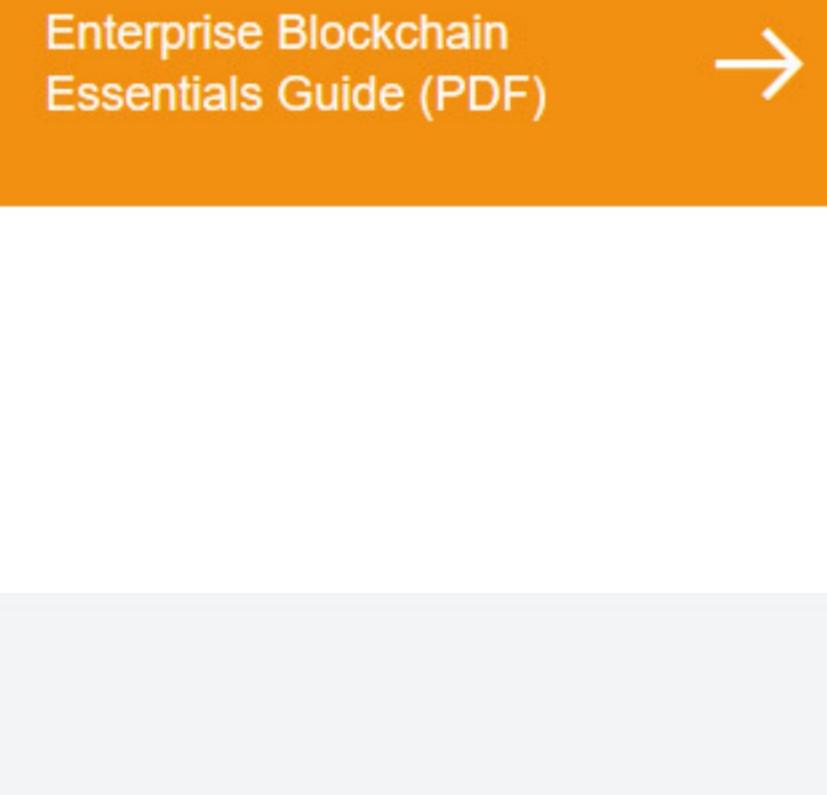
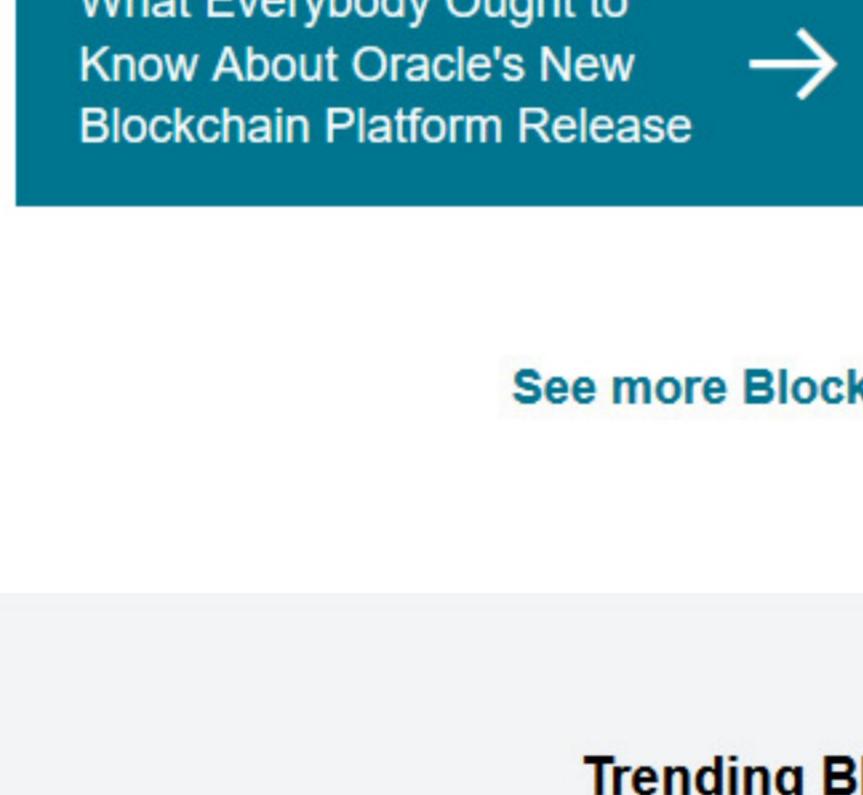
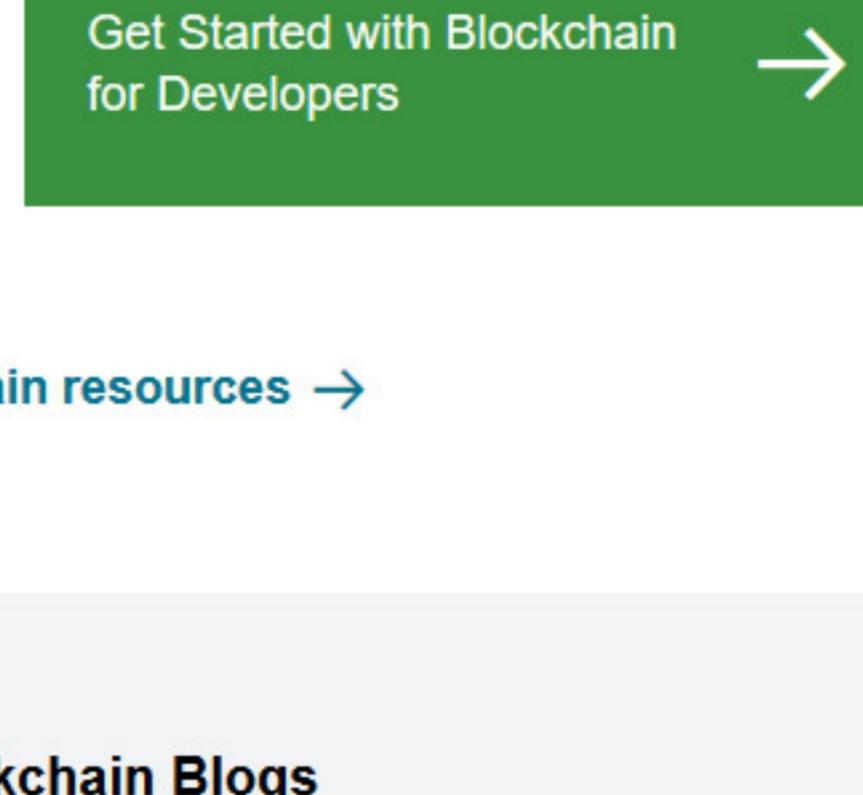
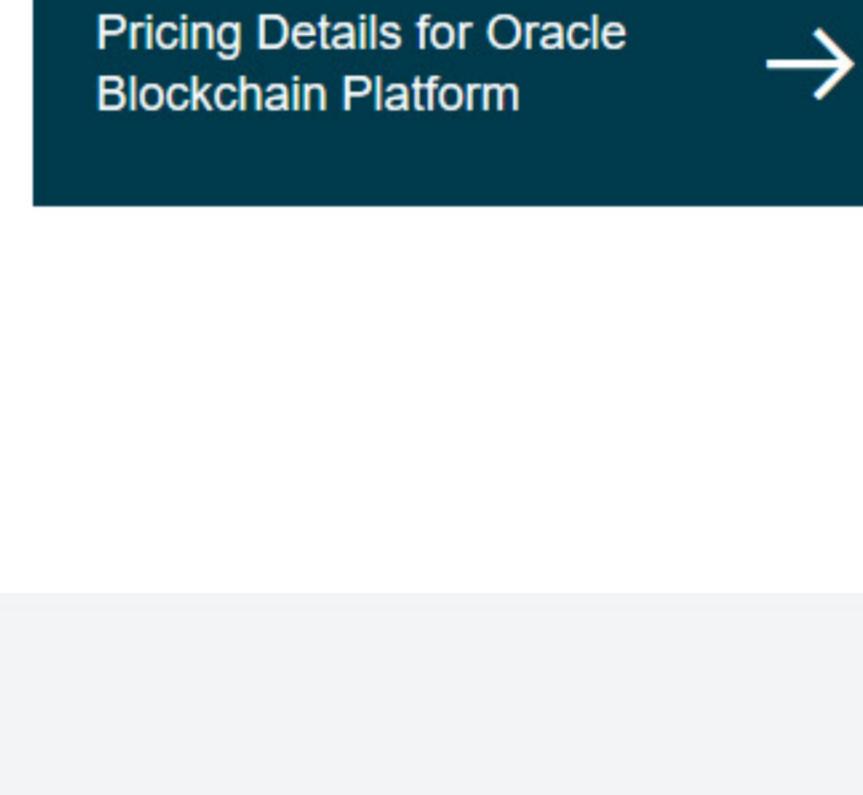
### Are you ready for new opportunities from a transformative technology?

- Enable new business models with a preassembled blockchain platform
- Rapidly onboard network participants with an enterprise-grade blockchain
- Improve transparency across your IT ecosystem with plug-and-play integrations

[Ebook: Cloud Essentials: Blockchain Technology for the Enterprise \(PDF\)](#)[Article: How Blockchain Can Protect Reputations and Attract Committed Customers](#)[Analyst report: IDC: "The Emergence of Blockchain: Seizing Opportunity," December 2017](#)

### Oracle Blockchain Cloud Platform

## Follow the Chain

[Enterprise Blockchain Essentials Guide \(PDF\) →](#)[What Everybody Ought to Know About Oracle's New Blockchain Platform Release →](#)[Get Started with Blockchain for Developers →](#)[Pricing Details for Oracle Blockchain Platform →](#)[See more Blockchain resources →](#)

### Trending Blockchain Blogs

## What's New in Blockchain

### The Future of Supply Chain Technology with Blockchain & IoT

In the consumer markets industries today, connected consumers are expecting a seamless, personalized and transparent shopping experience. Retailers and brand manufacturers alike have little choice but to respond, unless they want to be left behind. One key technology being discussed at length in...

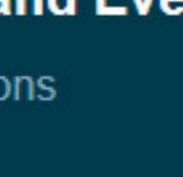
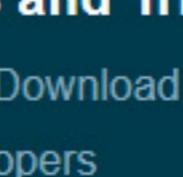
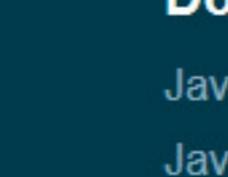
### Announcing the Oracle Intelligent Track and Trace Application!

Oracle Intelligent Track and Trace, is an application for businesses for supply chain management (available June 13, 2019).

### Tracking Sustainable Footwear from the Source

CANO produces sustainably sourced handmade Mexican huaraches. The company is using the Oracle Blockchain Platform to provide raw material traceability and supply chain visibility into the materials used to make the shoes...

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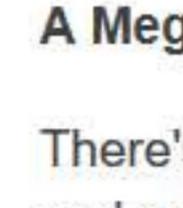
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APPDEV ... [view more](#)

October 16, 2017

## Blockchain - Why Now and Why Oracle?



Jay Chugh

SENIOR DIRECTOR, PRODUCTS

Co-authored by Jay Chugh and Padmini Murthy

### A Mega Movement in the Making

There's a lot of buzz around Blockchain, you all have been part of all those blogs, talks, and articles that are floating around. There are various schools of thought vouching for this as the next disruptive force that will transform the way we transact.



Remember the movement around 'digital transformation' that started a while ago and redefined several paradigms? It changed the way we shopped, traveled, transacted, communicated, and ran our daily functions. Several B2C and B2B businesses like Lyft, Instacart, Zoom, and others led this disruption in their way, fundamentally changing the way we lived.

And of course, this mega transformation movement was supported by other complementing technology forces such as AI, ML, IoT, etc., which enabled businesses to provide intelligently, connected and secure digital experiences.

### Why Is Everyone Talking About Blockchain?

Because trust is a difficult problem to solve. If a technology force can take care of this in transactions with a fool-proof mechanism, then we've crossed an enormous chasm. Blockchain as the same refers to is based on building blocks of data, chaining them, and locking them with what is called a hash. This tamperproof data then becomes an essential source of reference for transactions going forward. So you don't have to worry about whether you can trust the system to give you the right information – you can rely on the data that now lives in the Blockchain!

In the consumer world, if you got an orange from Walmart and wanted to track its origins – where it was picked from originally, what processes did it go through before it got to the store, and is it safe for you to consume it, you will now be able to track this using the Blockchain technology.

Let's take a few other examples from the enterprise world. In financial services, for instance, Blockchain technology can be used to reduce the time for a reconciliation of ledgers and accounts by creating a 'single source of truth' and granting access to all parties. In healthcare, providers, regulators, and agencies can now use Blockchain to maintain patient records a lot more securely.

This can also help insurance companies improve transaction monitoring and suspicious activities investigation. The retail supply chain and manufacturers are using Blockchain to record the movement of branded goods from manufacturing and delivery hubs to POS. This would help to increase the authenticity and correct any counterfeit flows.

These are only a few examples, and as you can see already, Blockchain has found its value in pretty much every domain.

### The Blockchain Ecosystem and Mechanics

Blockchain solutions cannot be built and agreed to in isolation. There will be a need for an 'ecosystem-based approach' where forces like the government, the consortiums, the regulators, and the technology providers can all collaborate on best practices and technology advancements to create an optimal solution. Support from regulating agencies and the government is essential for highly regulated industries like finance and healthcare.

Technology vendors will play a key role in creating and deploying innovative solutions around Blockchain. They will also be able to combine the power of already existing technology solutions and extend them to Blockchain.

Consortiums like the Hyperledger Fabric will be very critical. These consortiums will bring the industry collaborators, technology providers, and government on a unified platform to drive business innovation, especially required for regulated industries.

Regulators and agencies such as banks and the government will become essential to define some strict rules around sharing of information, record-keeping, overall data management and policing.

And now, on to the mechanics of how Blockchain works? There are [several videos](#) around this, but I'll try to explain it very simply. There are four essential elements to the Blockchain technology.

- **The Distributed Ledger Technology** – this is a database that is consensually shared, replicated, and synchronized across a network that is spread across multiple sites, institutions, and geographies.

- **The Smart Contracts** – it is code that is capable of facilitating, executing, and enforcing the negotiation or performance of agreement (i.e., contract) using the Blockchain technology. It runs on the nodes and invokes a request to the Consensus.

- **The Consensus Protocols** – the Blockchain is updated via a Consensus protocol. It ensures an unambiguous ordering and validation of transactions and guarantees the integrity and consistency of the Blockchain across geographically distributed nodes. Some Consensus protocols are decentralized/permissionless, and some are permissioned (think Byzantine). Other Consensus protocols are Raft, Paros, Sieve, etc.

- **The Messaging Service** – this enables inter-node communication among blockchain peers.

Every Blockchain application whether on-premise or SaaS will connect with these 'systems of engagement' via a REST API layer. And these systems will then do the magic of creating secure records based on market conditions and fairness. These records can then be stored and shared for specific business outcomes.

### Oracle Blockchain Solution

Oracle just announced its own Oracle Blockchain Cloud Service(BCS) at Oracle OpenWorld 2017. Oracle's Blockchain Cloud Service(BCS) is an enterprise-grade distributed ledger based platform designed to extend and scale ERP, SCM and SaaS and on-premise applications. It is designed to perform secure and scalable peer-to-peer transactions across a trusted network with tamperproof data.

Oracle has partnered with the Hyperledger Project ([www.hyperledger.org](http://www.hyperledger.org)), a consortium focused on private (or permissioned) Blockchain-based distributed ledgers and solutions across a variety of use cases and industries. The Hyperledger Fabric is an open source code base, managed as a project of the Linux Foundation.

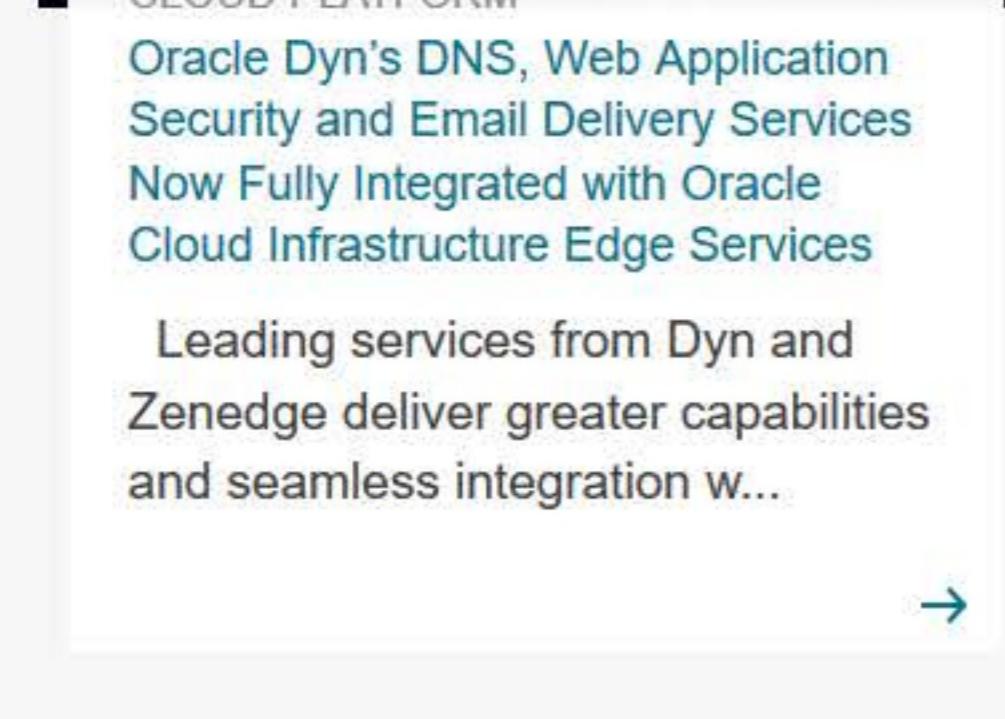
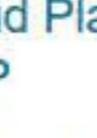
The Hyperledger supported solutions are also designed to run smart contracts through a combination of a modular architecture and consensus protocols. Oracle has also partnered with leading systems integrators and partners to deliver complete Blockchain solutions.

For more information on the benefits of Oracle's Blockchain services, please visit:

<https://www.oracle.com/blockchain>

### Join the discussion

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Craig Wentworth



# Technology & Suppliers

# Enterprise Blockchain Essentials

## Guide

January 2019

Blockchain platforms have evolved from their cryptocurrency origins. They are now being built to target enterprise use cases across many different industries (from financial services, through manufacturing and the supply chain, to healthcare, insurance, government, telecoms, and more). They're also becoming far better integrated with business systems and complementary technologies like IoT and business analytics platforms – and coming ready-built as managed services, wrapped in enterprise-friendly tools and utilities to make it easier to adopt in production environments.

**MWD Advisors** is a specialist advisory firm which provides practical, independent industry insights to business leaders and technology professionals working to drive change with the help of digital technology. Our approach combines flexible, pragmatic mentoring and advisory services, built on a deep industry best practice and technology research foundation.

## Top takeaways

1

### Moving from proofs-of-concept to production

Many organisations are now looking beyond their proof-of-concept and pilot projects, towards making blockchain work for them in a production environment. This transition tends to succeed when there's support and sponsorship from senior line-of-business / organisational representatives; and where there's an understanding of the project's context in the market or ecosystem in which it's designed to operate (as well as across a single business). Organisations are also looking to vendors with enterprise credentials to help their blockchain projects make the jump to production and make blockchain work for them in the way the rest of their IT works.

2

### Enterprise IT demands enterprise blockchain

The main technology market focus is now on the practical aspects of production-readiness that help customers move from proofs-of-concept to deploying at scale, across ecosystems. Blockchain deployments need to behave more like traditional IT capabilities, so blockchain becomes 'just another part of the IT estate'. This requirement manifests in two areas:

- Development and test considerations – i.e. safer, easier, more robust coding environments for smart contracts and decentralised applications; integrations with key enterprise systems (such as systems of record, identity management, and IoT platforms); and interoperability with other ledgers (because, pragmatically, organisations will inevitably find themselves members of many blockchain networks across the business over time).
- Operational considerations – from setup (such as network provisioning, configuring and member on-boarding); through resilience (high availability, backup, disaster recovery, monitoring, etc.); security (encryption, transaction privacy, etc.); and performance (both of the network, and of the choice of consensus mechanism, the use of any sidechains for parallelism, etc.).

3

### Blockchain platforms have evolved

First-generation blockchains can be typified by the Bitcoin blockchain network – public and open, relying on expensive and slow consensus mechanisms, and with limited on-chain functionality (though supporting the creation of 'trust anchors' that provide proofs-of-existence for hashed documents, databases, and so on). Ethereum's smart contract platform heralded the arrival of a second generation, built to execute autonomous, decentralised applications. A third generation is now taking the capabilities and characteristics of earlier incarnations and tailoring it for enterprise suitability – and that means wrapping blockchain services in the enterprise tooling outlined above, as well as developing targeted SaaS applications that utilise blockchain for specific use cases (like tracking and traceability).

## The blockchain story so far: three generations

We covered the emergence of blockchain and what the technology is (and isn't) good for in our earlier report [Blockchain for business: What is it and why should care?](#)

What we've also seen is that, in the relatively short time that organisations have been developing blockchain technology applications, the technology has seen three major generations evolve. Each generation marks a step-change in capabilities, and a turning point in blockchain's applicability and adoption in mainstream business use cases.

The three sections below outline the three generations of blockchain technology to date.

### From crypto origins, through token value exchange, to digital fingerprinting and 'trust anchors'

The first generation of blockchain is typified by the technology that underpins the Bitcoin cryptocurrency. It's open and public; it uses a *Proof-of-Work* consensus mechanism, requiring the incentivisation of miners (and so is expensive, and slow to run); and it was designed primarily to record transactions for the exchange of tokenised value (e.g. Bitcoin transfers between wallets).

On the surface the transaction cost, block size (and what you can store in blocks), scalability and speed of, say, the Bitcoin blockchain would appear to limit its appeal in the enterprise... unless your business is accepting retail payments in cryptocurrencies. Even if you're looking for a platform to facilitate payment transfers, you're better off considering something with a more modern architecture like Stellar, or Ripple (which doesn't rely on mining for its consensus) because Bitcoin's throughput just wouldn't keep up. However, even these examples have limited scope for further enterprise use beyond crypto token exchange – they're intended to rival inter-bank transfer systems like the SWIFT network, and in their current iteration they're not targeting wider use cases beyond financial payments.

However, the fact that Bitcoin is the most mature, longest unbroken, public blockchain also brings other benefits that organisations can take advantage of. It provides a chain upon which to 'anchor' data with a cryptographic fingerprint. Other public blockchains can be used for this too (we'll explore this more later).

As we explained in [Blockchain for business: What is it and why should care?](#) most first generation blockchains don't store 'real' (non-cryptocurrency) data in the blockchain itself, because too much of that can lead to 'chain-bloat' (where there's so much data being committed that it becomes too slow and costly to do anything useful). Instead they store 'digital fingerprints' (hash values) of the data that link to digital assets which have been stored elsewhere, off-chain (but somewhere accessible by bone fide interested parties – the [InterPlanetary File System \(IPFS\)](#) is often used in cases where decentralisation needs to be preserved across the storage layer, and so simply linking to a single organisation's cloud storage account wouldn't be acceptable). In these cases the blockchain then is used to track ownership of these assets, and act as an immutable log of activity. It means that these blockchains can provide a 'proof of existence' for an item of hashed content (such as a document, process output, database, or private blockchain sidechain) in addition to enabling trivial tasks like making cryptocurrency payments.

Some vendors have focused initially on 'anchoring' as a way of blockchain-enabling their offerings to provide capabilities that enhance trust in ecosystem scenarios when extending process reach beyond the enterprise boundary.

## Smart contract platforms, and the era of decentralised applications

Post-Bitcoin developments in blockchain technology have enabled complex business logic (in the form of 'smart contracts' or 'chaincode') to be encoded into blockchains, running against data either held on-chain or elsewhere, and used as part of an autonomous, decentralised workflow. It's arguably this advance that's paved the way for an explosion of non-cryptocurrency interest in blockchain technology – enabling people to effectively develop distributed applications that reside and run on a blockchain (triggered by external events and pulling in data from the Internet or IoT).

The development of the Ethereum open-source, public blockchain-based distributed computing platform in 2015 signalled the dawn of blockchain's second generation. With Ethereum (and the myriad variants borne of forked Ethereum code, or based upon its principles), distributed applications can be built using 'smart contract' scripting functionality and executed on participating network nodes. In some cases these are performed on the public Ethereum mainnet; other instances make use of private Ethereum networks to enhance transaction confidentiality (and provide more control over transaction speed, network performance, and even choice of consensus mechanism). Some instances bring the ability to link or anchor these private transactions periodically to the mainnet, in order to provide an immutable log that guards against the threat of bad actors attempting to subvert the consensus on smaller networks.

Although Ethereum does have its own cryptocurrency (Ether), the tokens are mined as part of Ethereum's Proof-of-Work consensus process and used to pay for the computational resources that run the distributed applications on its platform.

In addition to organisations deploying the open source Ethereum itself, J.P.Morgan has developed what it refers to as an "enterprise-focused version of Ethereum" in the form of Quorum (addressing concerns around privacy and scalability, etc.) – which is available as part of a number of Blockchain-as-a-Service offerings. Microsoft announced its Azure Blockchain Workbench in October 2018, which features a *Proof-of-Authority* based Ethereum; and ConsenSys offshoot Kaleido has partnered with AWS to offer an Ethereum-based service through the AWS Marketplace.

The Ethereum Foundation, which oversees the development of the Ethereum platform, has begun to address some enterprise concerns too through the work of the [Enterprise Ethereum Alliance \(EEA\)](#). The EEA's members are drawn from enterprises, start-ups, academics, and technology vendors – all with an interest in how Ethereum develops for the enterprise. In July 2018 the EEA has announced the [Enterprise Ethereum Architecture Stack](#) – a conceptual framework which characterises and standardises components from the Ethereum ecosystem to show how the upcoming Enterprise Ethereum standards-based specification will fit together. Its hope is that this will provide user groups and vendors with the means to construct standards-based solutions on Ethereum that satisfy enterprise requirements (like privacy, scaling, tooling and application development), without having to build everything from scratch. Three months later, the EEA announced that it was entering into an agreement with [Hyperledger](#) (from the Linux Foundation) to [become associate members of each other's groups](#) – further strengthening the drive to bolster Ethereum's enterprise credentials as blockchains level-up to production-readiness (as well as fostering greater inter-ledger interoperability, as organisations start to become members of more diverse blockchain networks).

## Production-ready, enterprise-grade, integrated blockchain at scale

A third generation of blockchains have focused specifically on the needs of enterprises wanting to deploy blockchains in full-scale production – boosting core enterprise-friendly capabilities (relating to consensus mechanism choices, privacy features through channels and sidechains, etc.), and also providing wrap-around tooling and integrations.

It's here where major established enterprise technology vendors are setting out their stalls with a spread of enterprise blockchain frameworks and tools, and blockchain-enabled applications, all designed to operate and integrate in production environments.

Although there are still concepts to be proven in some potential blockchain usage scenarios, many organisations are now starting to look beyond this phase to explore more about what the business benefit is (to the individual enterprise, and to the wider ecosystem it inhabits as a whole). Projects tend to succeed when there's a line-of-business / organisational strategy sponsor; and where there's an understanding of the context in the market / ecosystem, as well as across the business.

Organisations are also looking to vendors with enterprise credentials to help their blockchain projects make the jump to production and make blockchain technology work for them in the way the rest of their IT works.

Many enterprise vendors are members of Hyperledger, and have offerings based on its projects (such as the Fabric blockchain framework); some offer Ethereum-based solutions, tailored for the enterprise; and R3 is marketing its Corda blockchain platform at use cases beyond its financial services base now (there's an open source version alongside a commercial variant, which sports enterprise extensions).

Notwithstanding the work of the EEA (described above), there's also a range of third generation blockchain platforms that have sprung up in an effort to plug Ethereum's perceived gaps in meeting enterprise needs. However, with the drive towards standardisation in the Ethereum landscape, and the interoperability amongst the Hyperledger stable, smaller independent players will find it increasingly difficult to differentiate a novel platform in a way that doesn't put off enterprise buyers (with their need for stability, reliability, scalability, interoperability, etc.).

## Oracle's Blockchain offering

Oracle initially launched its Hyperledger Fabric-based [Blockchain Platform](#) at its OpenWorld conference in October 2017, two months after the company joined the Linux Foundation's Hyperledger project. It became generally available, as Oracle Blockchain Platform, in July 2018 (offering the automated recovery capabilities inherent in Oracle Cloud Platform's suite of autonomous services). It's a fully-managed PaaS (part of the Oracle Cloud Platform) built on the Hyperledger Fabric permissioned blockchain framework. The Oracle Blockchain Platform features a variety of enterprise-grade services that provide continuous backup, point-in-time recovery, rapid provisioning, and simplify the operational management of a blockchain network. The product offers plug-and-play integrations with key business applications within or through Oracle Cloud (leveraging Oracle's container lifecycle management, identity management, and event services), recognising the need to support heterogeneous environments – including on-premise environments and non-Oracle clouds alongside Oracle Cloud (the Blockchain Cloud Service also provides support for interoperability with non-Oracle Hyperledger Fabric instances).

Oracle's aim is to offer an enterprise-friendly platform that leverages the advantages of blockchain to a customer base more at home with 'traditional' business applications. The Oracle-Blockchain Platform leverages Oracle's enterprise-grade integration, provisioning, support, and management capabilities to offer customers a platform designed to help them take the next steps beyond proofs-of-concept to bring production services online (with all the attendant issues around scalability, on-boarding, security, integration, etc.)

Oracle has positioned its Oracle Blockchain Platform as a distributed ledger cloud platform for customers looking either to build new blockchain-based applications, and/or extend their current SaaS, PaaS, IaaS (ERP) and on-premises applications with blockchain capabilities to provide "tamper-resistant transactions on a trusted business network." Oracle's 'extras' (on top of Hyperledger Fabric) are designed to build on the open source framework with capabilities that simplify and accelerate blockchain deployment, leverage identity management cloud to provide high level of security protections, and provide tailored support for specific use cases (through the involvement of the company's industry teams) in the areas of ERP, supply chain / manufacturing, and open banking.

Oracle's go-to-market approach for the [Oracle Blockchain Platform](#) has four parts, focusing on:

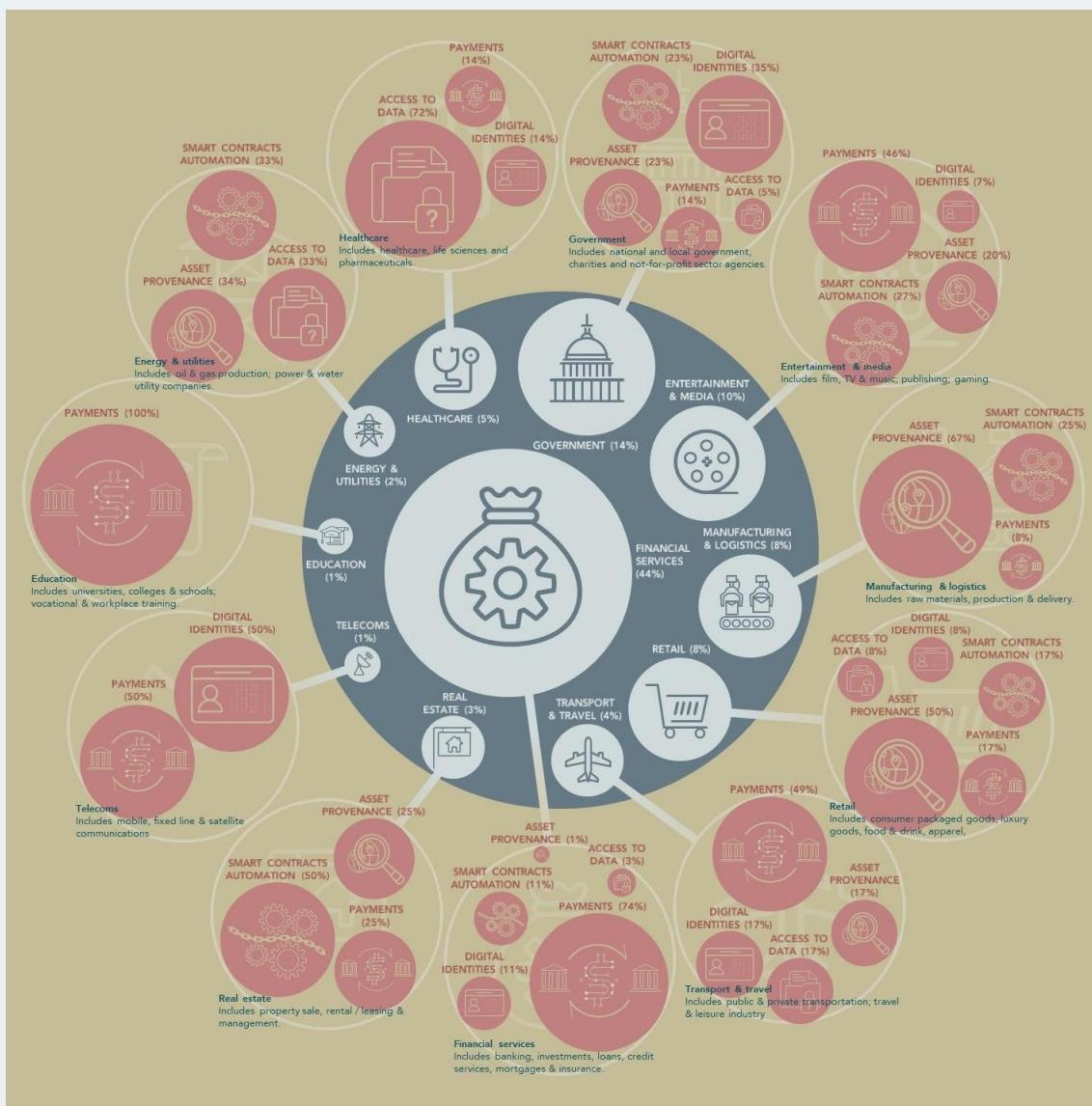
- Customers of its wider platform and on-premises applications.
- Targeting start-ups via the company's start-up accelerator programme; SaaS and packaged applications.
- Software vendors looking to incorporate blockchain into their offering or build on a pre-assembled platform.
- System integrators (global SIs, regional firms, and specialist blockchain boutiques).

## What next for blockchain in business?

As well as the trends we're seeing in blockchain as organisations seek to move their proofs-of-concept on to production services, demanding more production-grade blockchain products (based on more enterprise-friendly blockchain platforms), we're also tracking an increasing level of diversity in the types of blockchain projects being undertaken (and the industries experimenting with putting them to use); and the evolution of new business models and networks around blockchain-infused ways of working.

For example, as our ongoing blockchain project-tracking research shows (as illustrated in figure 1 below), we're now seeing far more instances of blockchain initiatives being announced outside of the technology's initial base in financial services. This isn't just manufacturing and government (where we saw the most non-fintech interest six months ago); there's far more blockchain showing up in other industries like retail, healthcare, transport and travel, too.

**Figure 1** Where and how is blockchain being used today?



Source: MWD Advisors

In addition, we've seen the spread of project types levelling out: when we started tracking blockchain projects in 2017 we saw an overwhelming sea of payment platform projects springing up – a natural major use case from blockchain's cryptocurrency origins, this set has been joined by as strong a showing for asset provenance projects (with a growing number of vendors eager to assemble a coherent offering that injects blockchain capabilities into supply chain management solutions to provide trusted platforms that service wide business ecosystems).

Although a number of recent news reports appear to be anticipating a slow-down in blockchain interest in the financial services sector (as predicted benefits maybe aren't being seen as quickly or easily as had been hoped, or where regulatory concerns are forcing a pause in procedures before moving to production), we're seeing a lot of excitement about use cases relating to asset provenance and automation in manufacturing, logistics and supply chain management.

Interestingly it's also here where vendors have chosen more to focus on embedding blockchain as part of a wider solution – usually alongside IoT technologies, often with AI and analytics too – rather than lead on it as more of a solo technology play.

As for the evolution of new ways of working inspired by blockchain, this is manifesting as explorations of new revenue streams beyond the efficiencies borne of disintermediation (enabled by increased trust and transparency being brought to a previously asymmetric relationship). Barriers to collaboration are being removed as the ways in which organisations interact with each other and with individuals change. As a natural consequence, we expect that organisations will rapidly become more likely to encounter multiple blockchain platforms and networks, making it ever more imperative to crack inter-ledger interoperability as well as single blockchain platform integration with traditional business systems.

These new blockchain initiatives will require business cases that determine how benefits of new ways of working are realised by all parties involved (not just a statement of overall value to the network as a whole); and these approaches will be used to incentivise new partners to join existing networks rather than start their own. However, a move towards blockchain platforms that seek to attract non-founder members will require thinking in advance around governance issues and questions of influence and value distribution. We're already seeing this play out in the supply chain arena, with new blockchain vendor / trade partner consortia like the Global Shipping Blockchain Network. Shipping companies start to question whether their interests are likely to be best served by joining an existing platform dominated by such a large industry player.